

Figure 1 - Process Control System

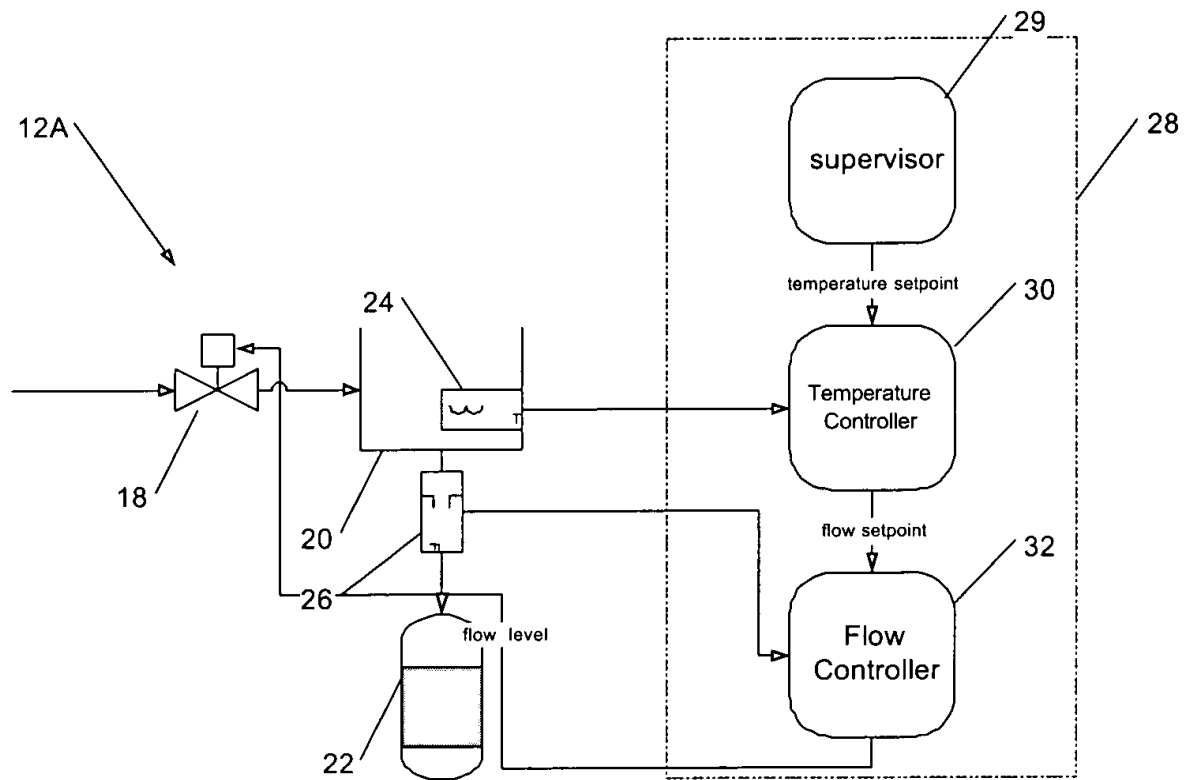


Figure 2 - Exemplary Controlled Process

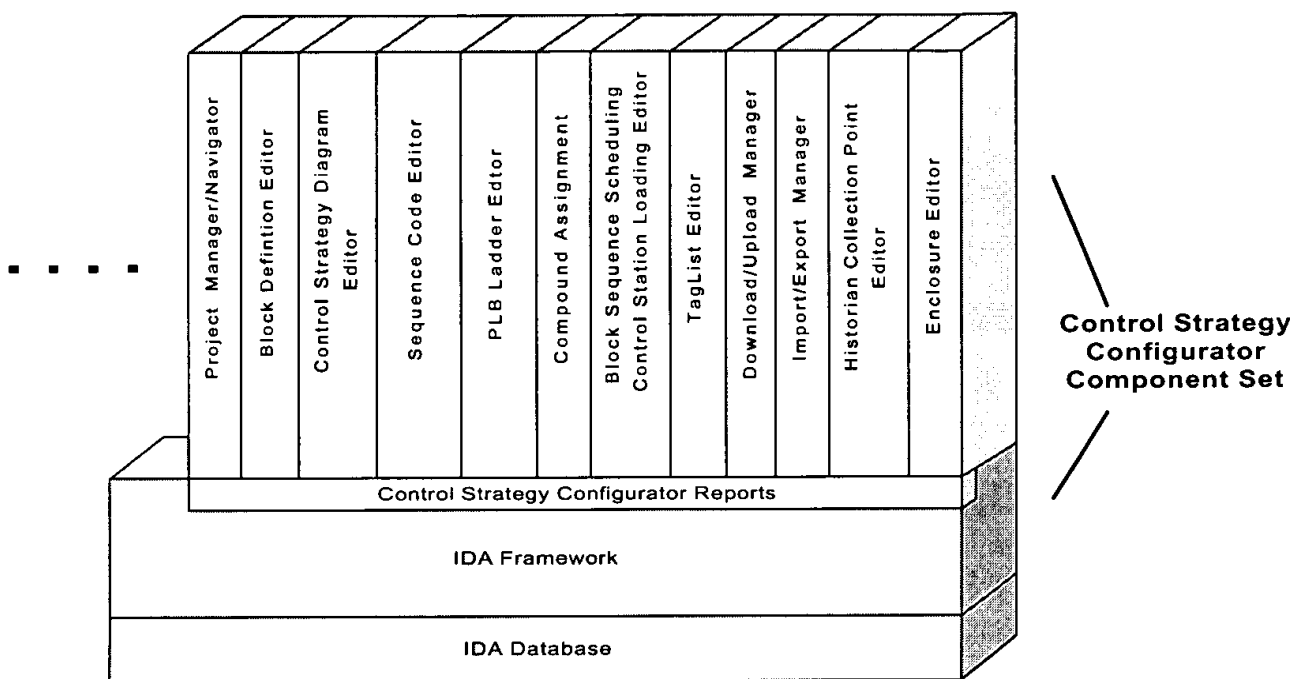


Figure 3 - Control Strategy Configurator Components

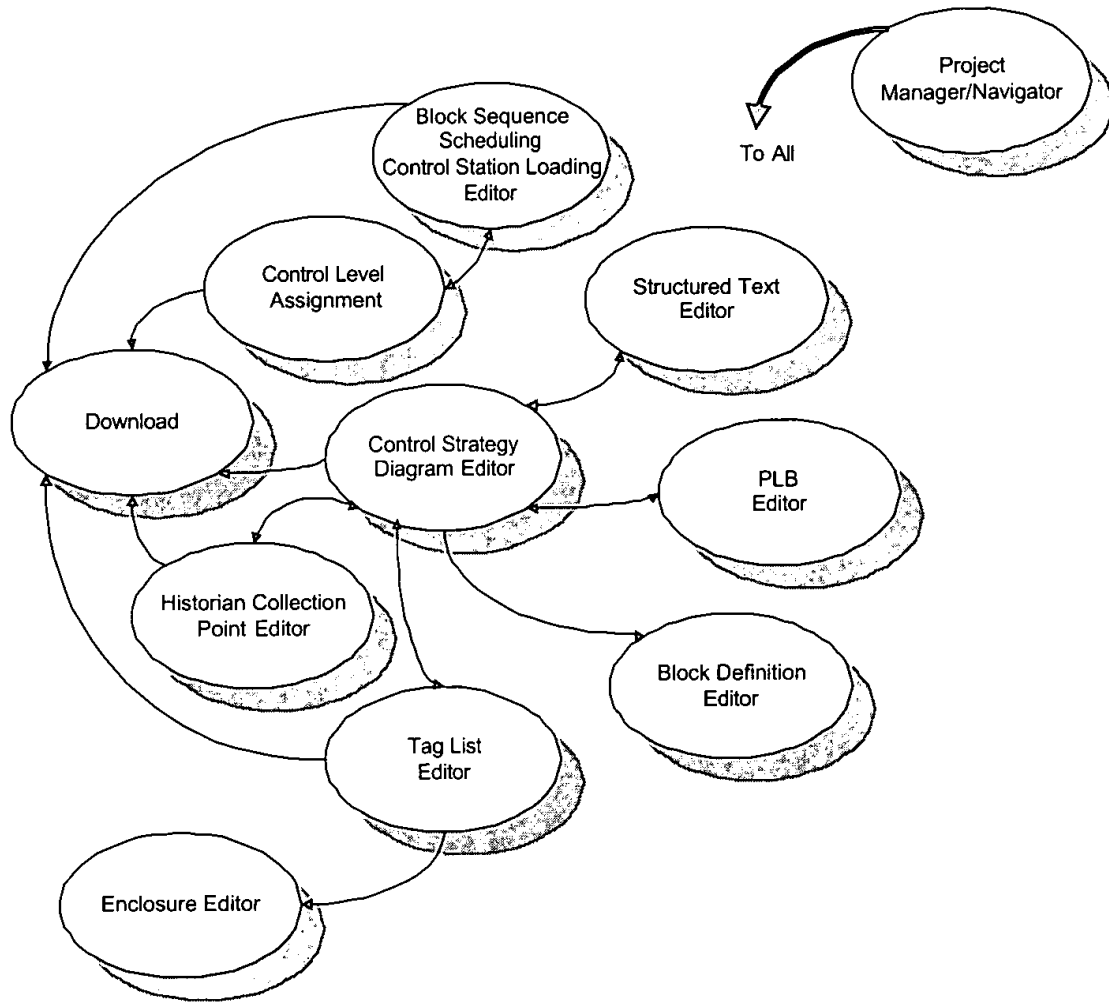


Figure 4 - Component Interaction Diagram

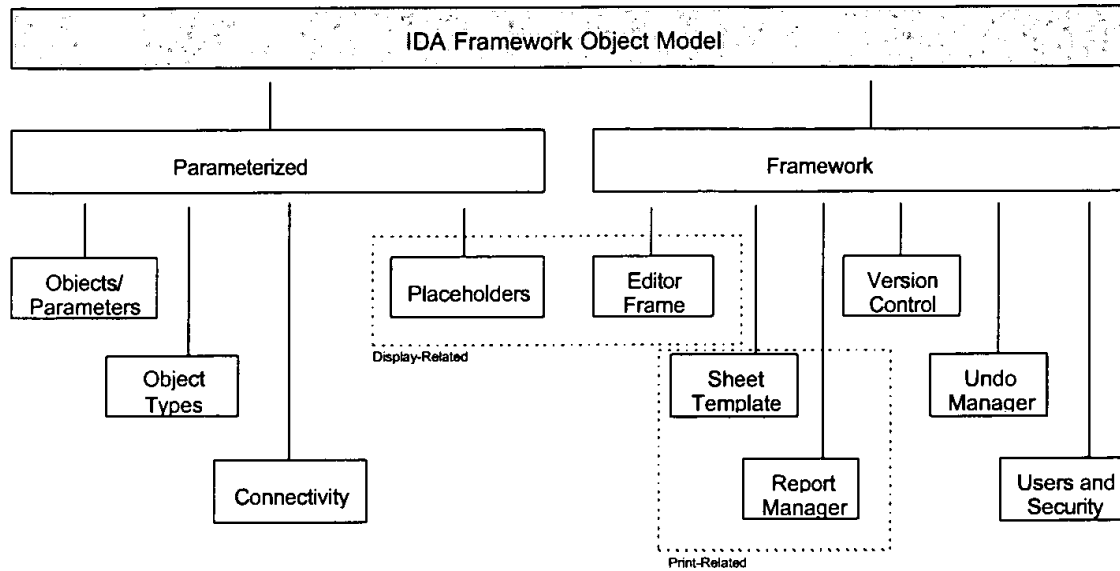
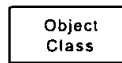
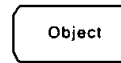


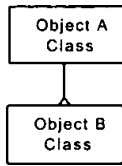
Figure 5 - IDA Framework Object Model Components



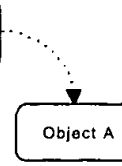
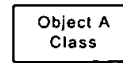
Indicates an object class.



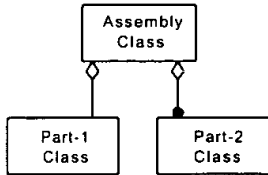
Indicates an instance of Object Class.



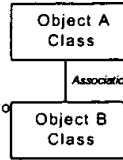
Inheritance - Object B inherits all data and behavior of Object A. Object B differs from Object A by adding methods and/or data, or overriding one or more existing methods in Object A. Object B is typically referred to as a "subclass" of Object A.



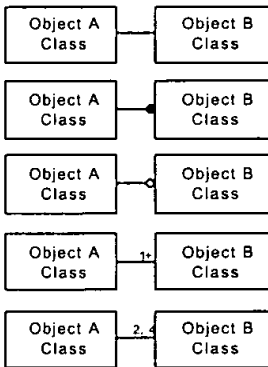
The Object A Class is responsible for creating instances of Object A. The Object A Class is often referred to as the "class factory" for Object A.



Aggregation - Assembly Class is composed of two other classes: Part-1 and Part-2. For each instance of Assembly Class, there is one, and only one, instance of a Part-1 Class, and zero or more instances of a Part-2 Class.



The Object A Class has an association *Association Name* with the Object B Class.



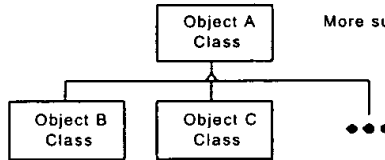
One, and only one, instance of Object B is associated with each instance of Object A (and vice versa).

Zero or more instances of Object B may be associated with each instance of Object A.

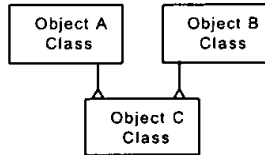
Zero or one instance of Object B are associated with Object A (optional relationship)

One or more instance of Object B are associated with each instance of Object A.

One two or four instances of Object B are associated with each instance of Object A.



More subclasses exist.



Multiple Inheritance - Object C Class inherits the data and methods from both the Object A Class and the Object B Class i.e. Class C objects are subclasses of both Object A and Object B objects..

Figure 6 - Object Model Notation Conventions

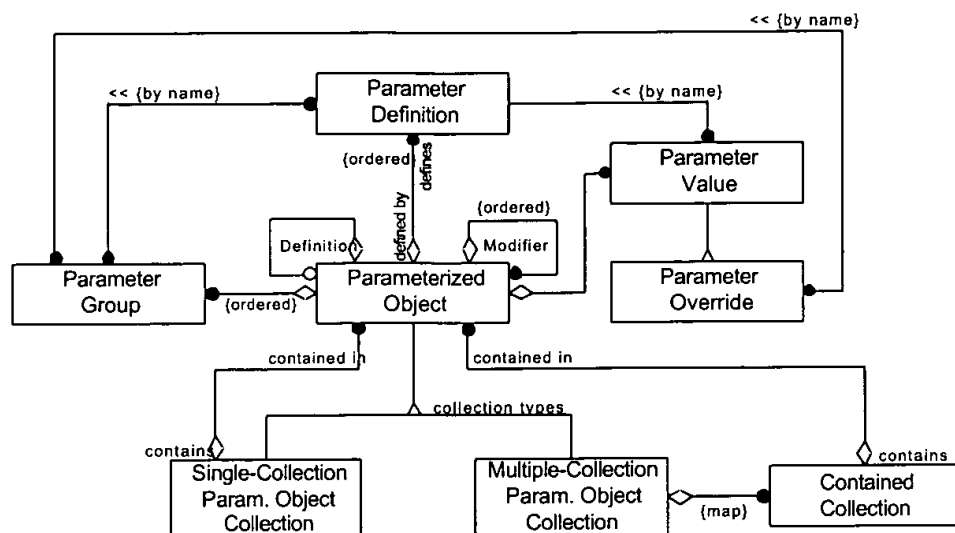


Figure 7 - Parameterized Object Model

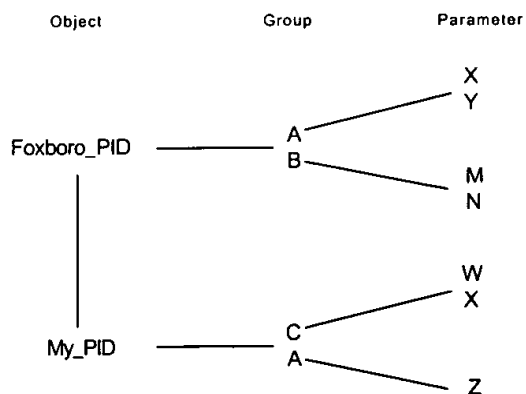


Figure 8 - Parameter Group Inheritance

SECRET

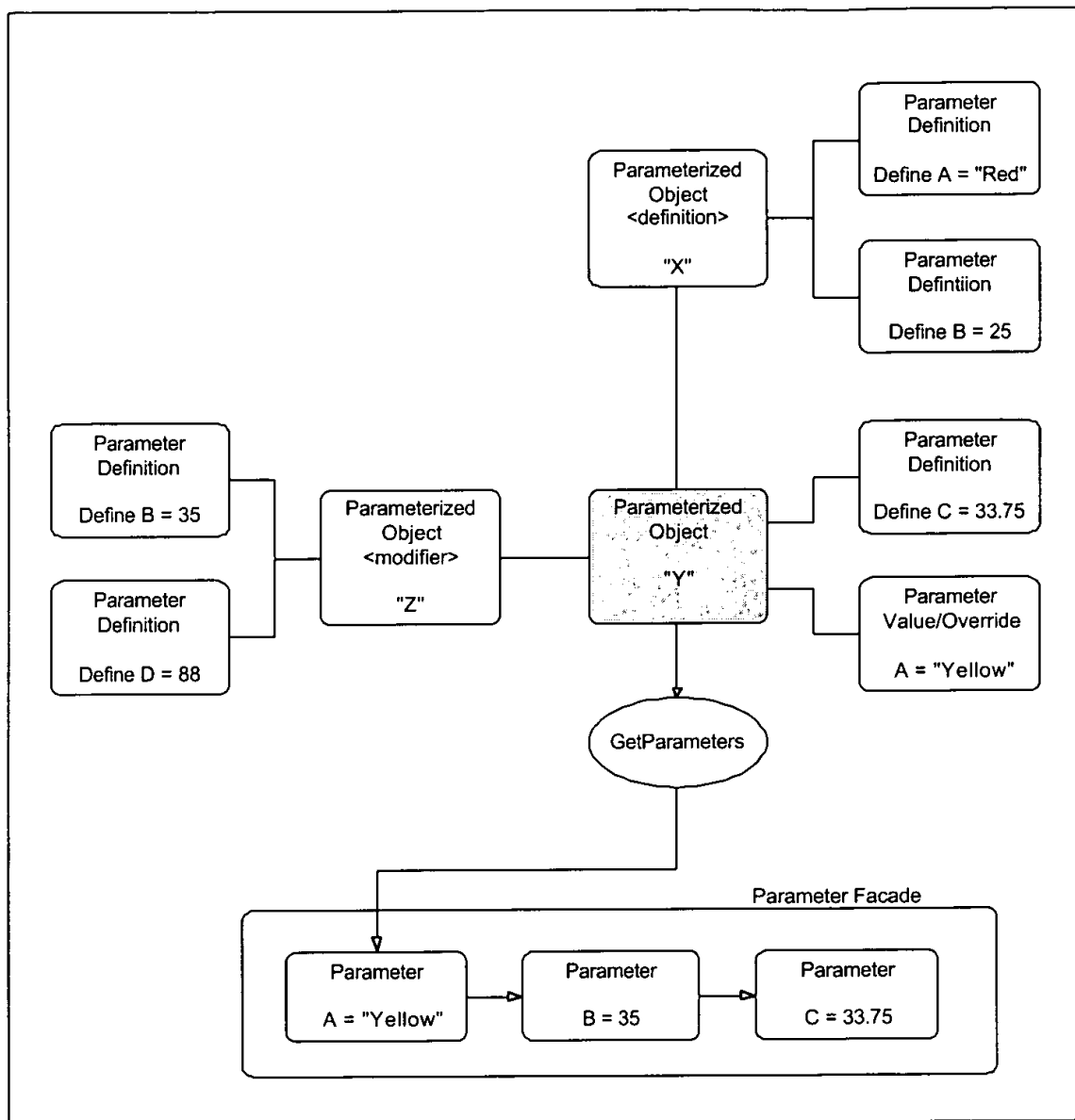


Figure 9 - Parameterized Object Example

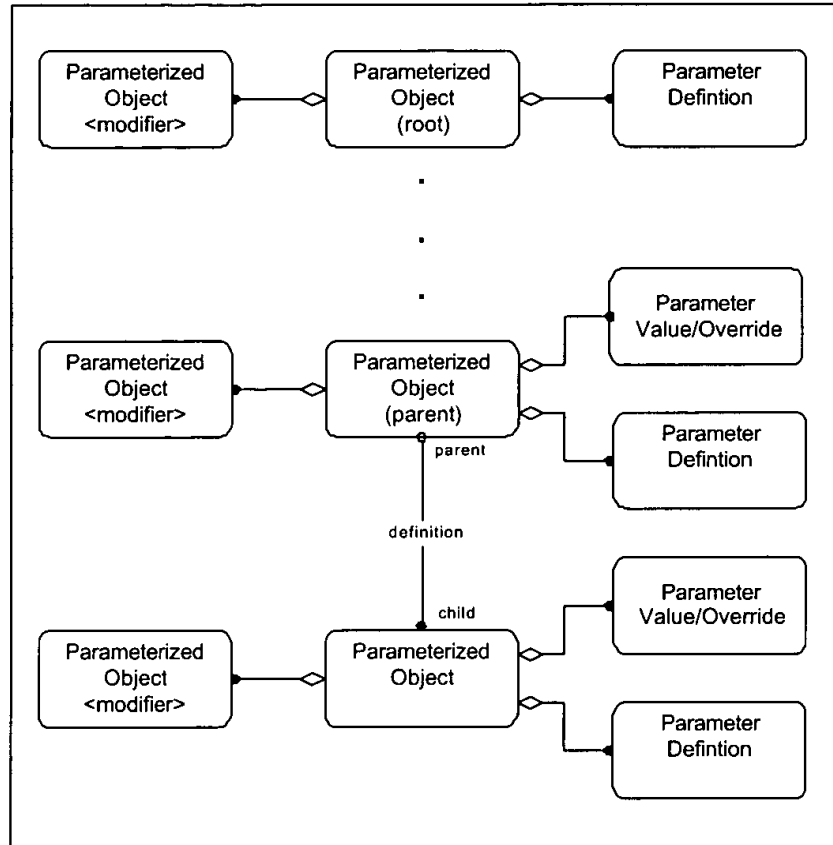


Figure 10 - Creating A Parameter List

	Defined In	Parameter	User Tab	Label	Help String	Tool Tip String	Edit Control Type	Format String	Choice List
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									

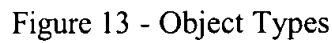
Figure 11 - Parameter Definition Editor

AIN

Standard	Real-Input	Real-Output	Bad-Alarm	More...
Achnge	0			
Crit	0			
Pnt	0			
Prtype	0			
Rawc	0			
Name				
Type	AIN			
Descrp				
Period	1			
Loopid				
Initma	1			
Inhopt	0			
Manalm	0			
lomopt	1			
lom_id				
Pnt_no	1			
Sci	0			
Meas	0			
Hsco1	100			
Lsco1	0			
Dello1	1			
Eol	%			

OK Cancel Download

Figure 12 - Parameter Editor Example



New Object Type [X]

Object Type:

Description:

Create From: [...]

Creation Method:

☒ Copy ☐ Derive

Attributes:

☒ Configurable ☒ Downloadable

Assignable To:

☒ System Hierarchy ☐ Plant Hierarchy

Defined By:

☒ Foxboro ☐ User

Figure 15 - Creating New Object Types

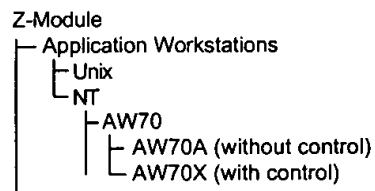


Figure 16 - Type Awareness Example

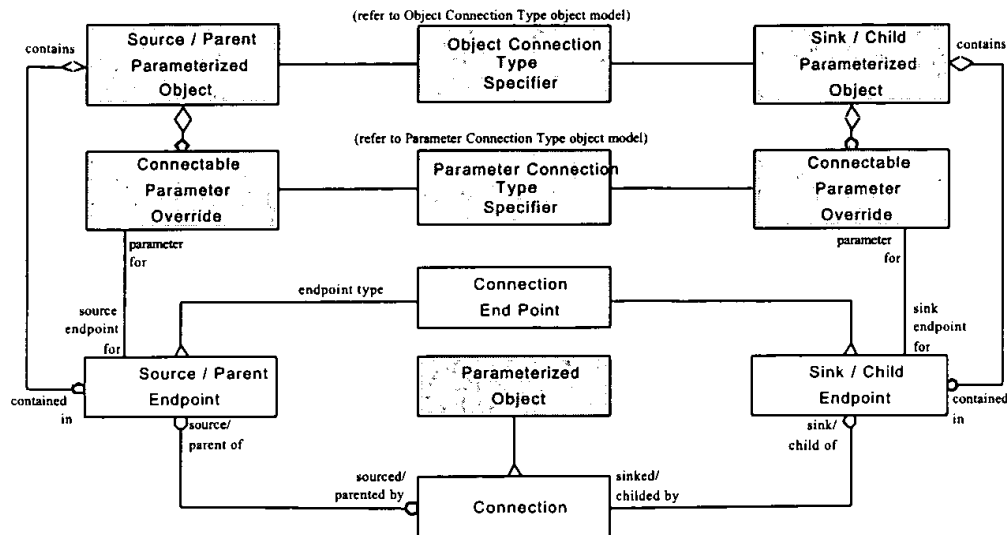


Figure 17 - Connection Object Model

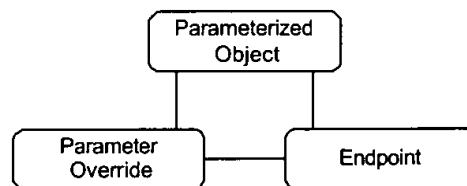


Figure 18 - Parameterized Object - Override - Endpoint Triad

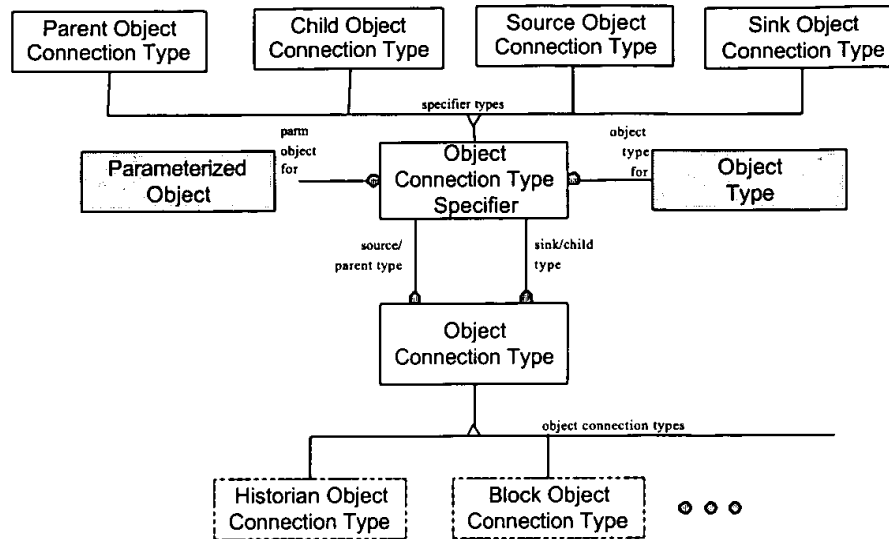


Figure 19 - Object Connection Type Object Model

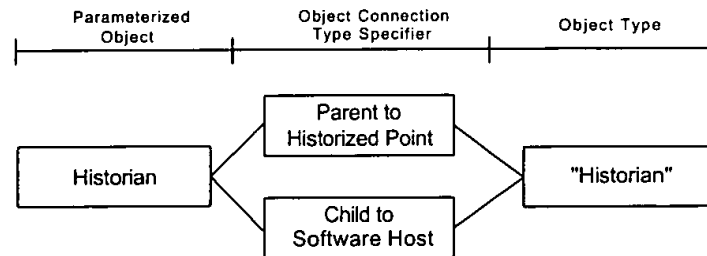


Figure 20 - Example of Simultaneous Parent/Child Object Connectivity

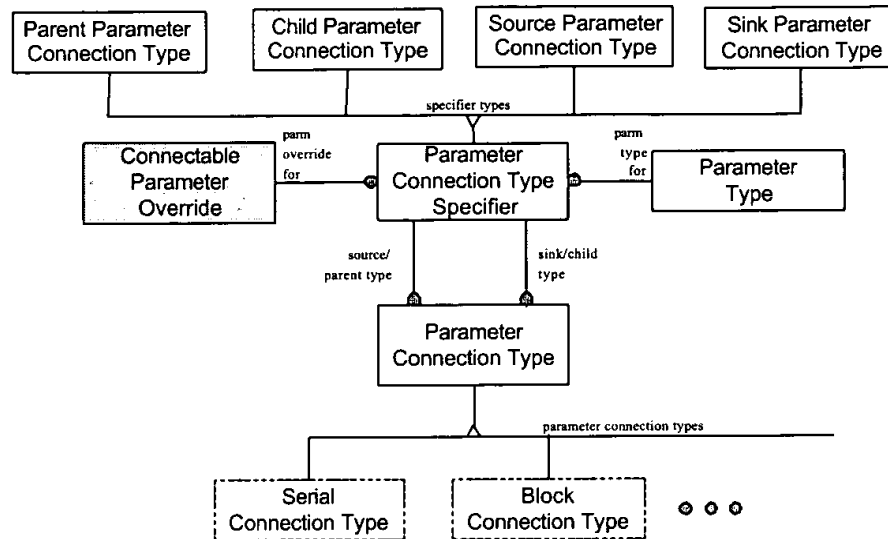


Figure 21 - Parameter Connection Type Object Model

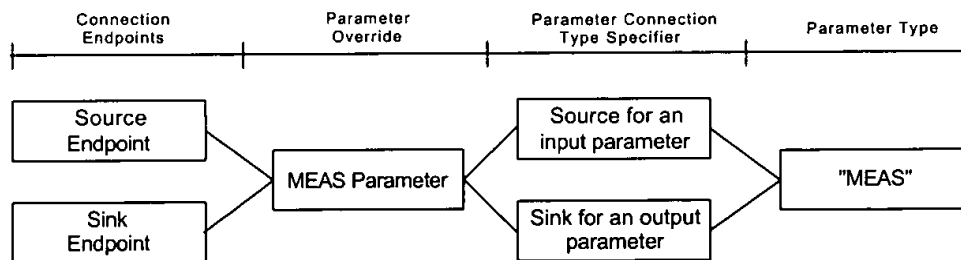


Figure 22 - Example of Simultaneous Source/Sink Parameter Connectivity

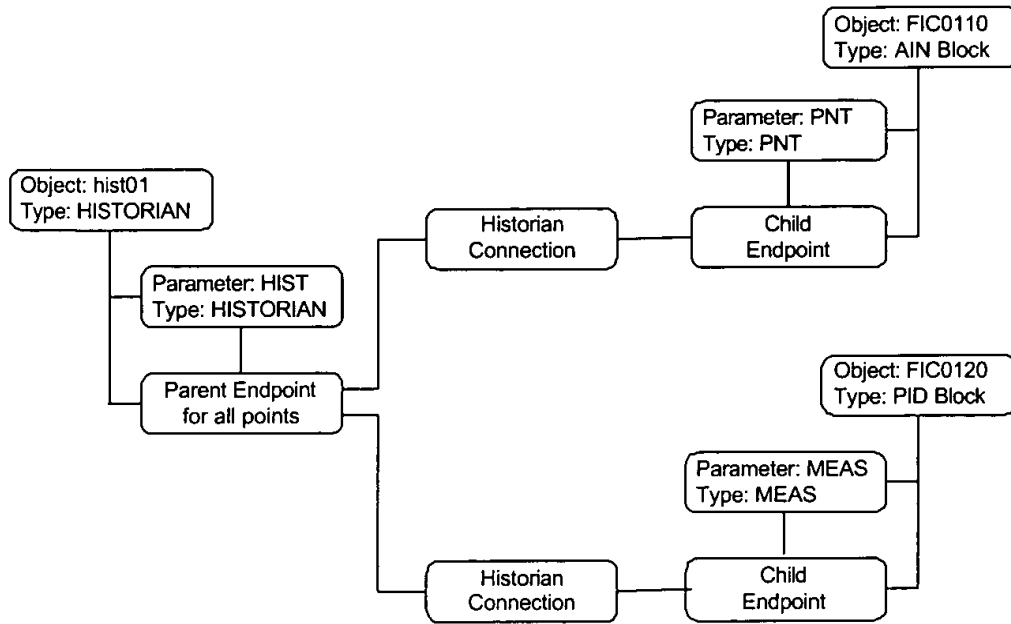


Figure 23 - Parent/Child Connectivity Example - Case #1

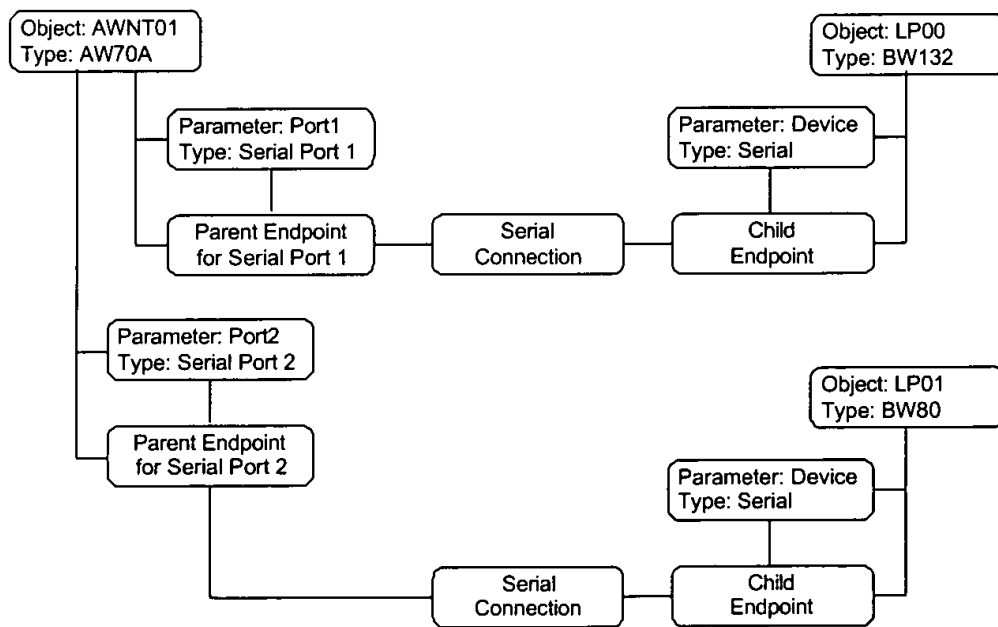


Figure 24 - Parent/Child Connectivity Example - Case #2

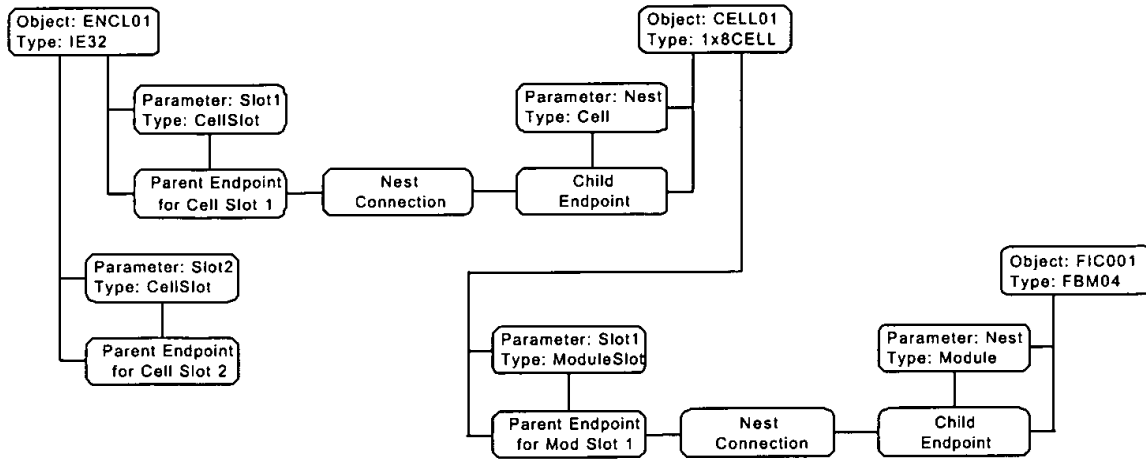


Figure 25 - Parent/Child Connectivity Example (Nest) - Case #3

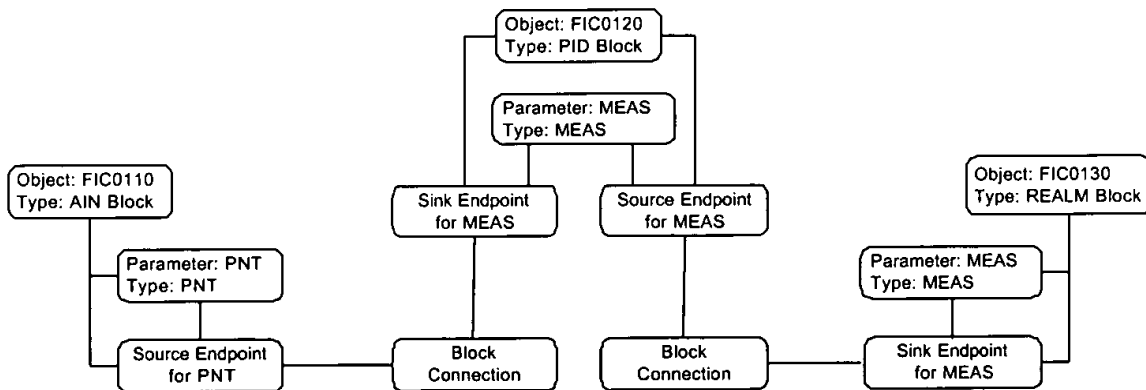


Figure 26 - Source/Sink Connectivity Example

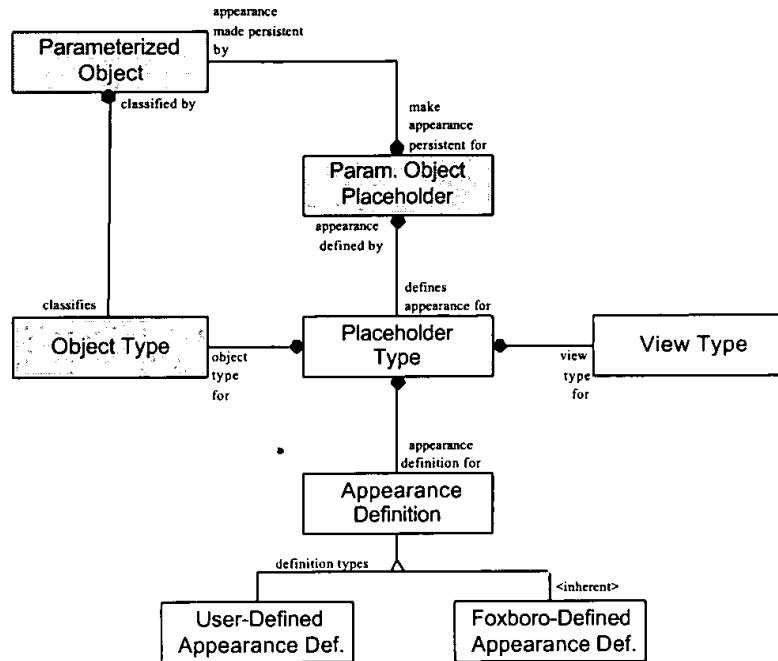


Figure 27 - Appearance Object Model

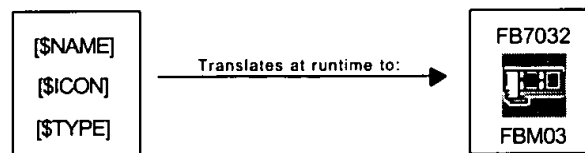


Figure 28 - Appearance Definition Example

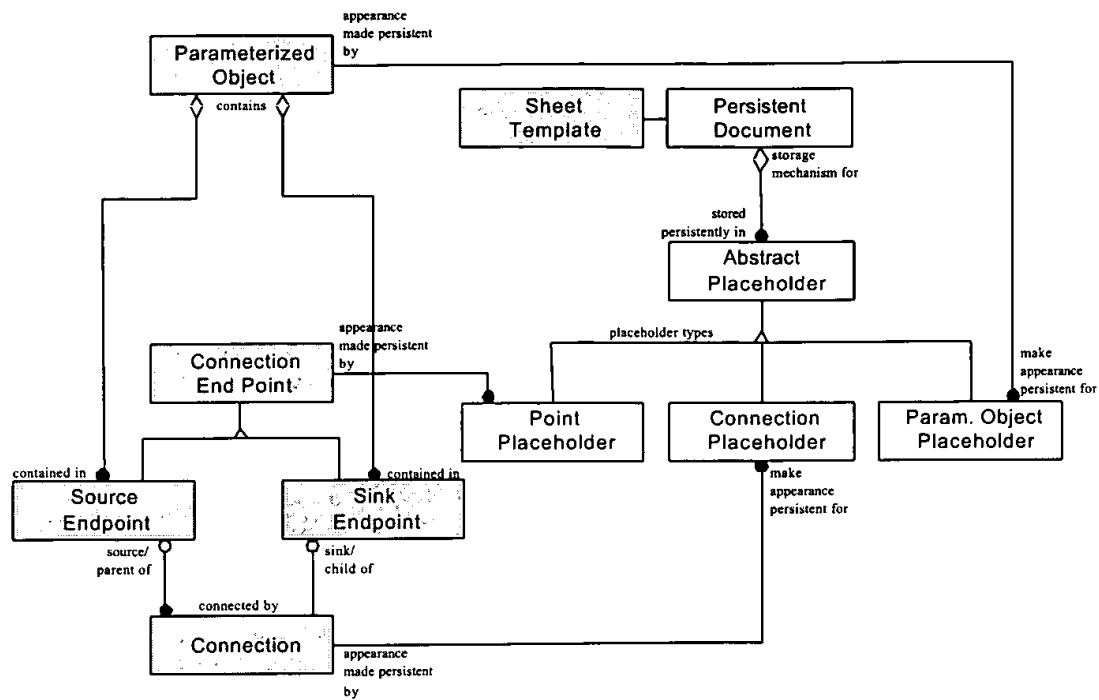


Figure 29A - Placeholders Object Model

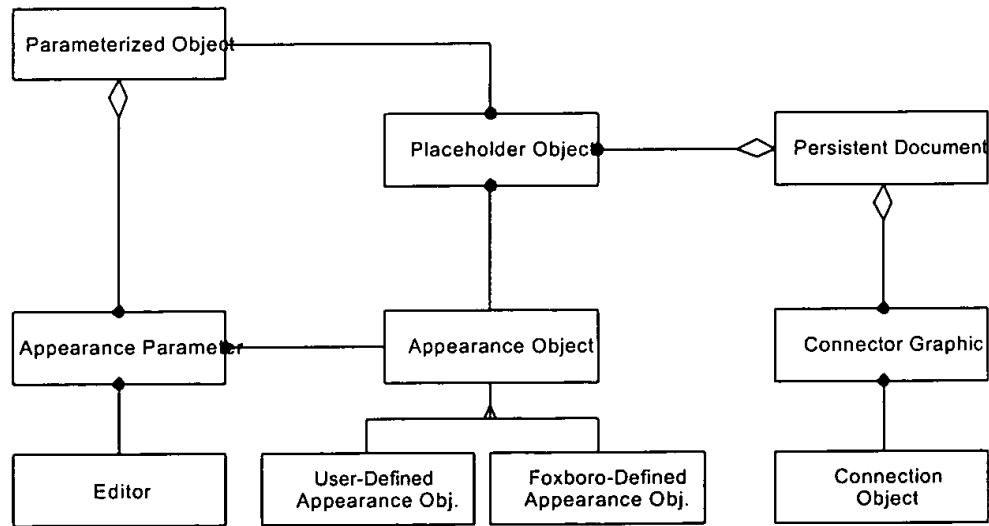


Figure 29B - Combined Placeholder/Appearance Object Model

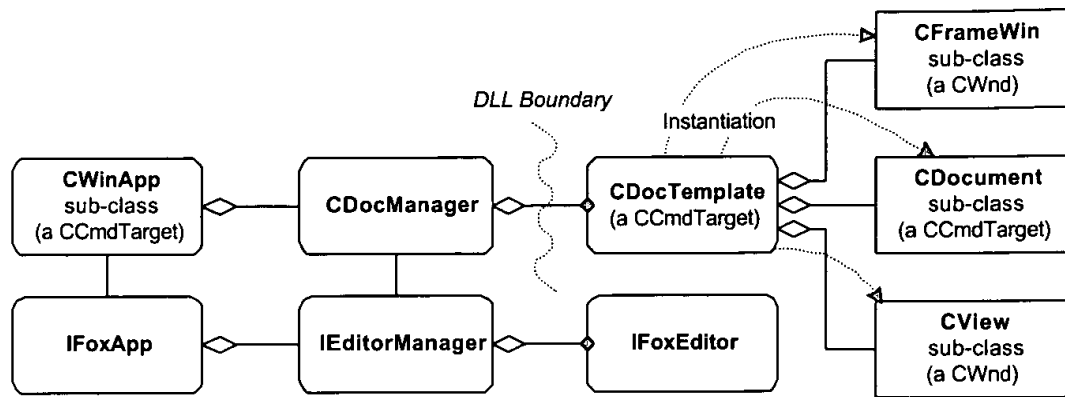


Figure 30 - MFC Document/View Architecture

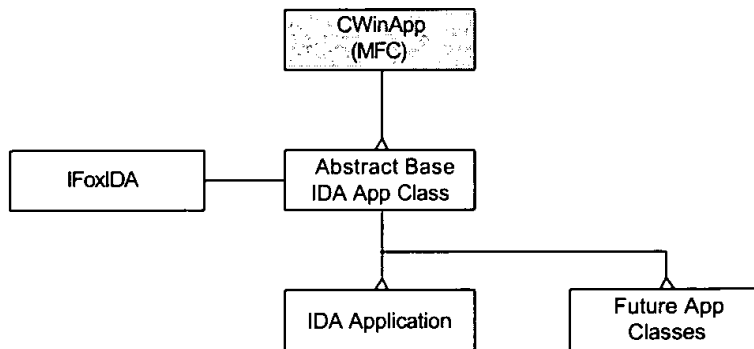


Figure 31 - The IDA Application Class Architecture

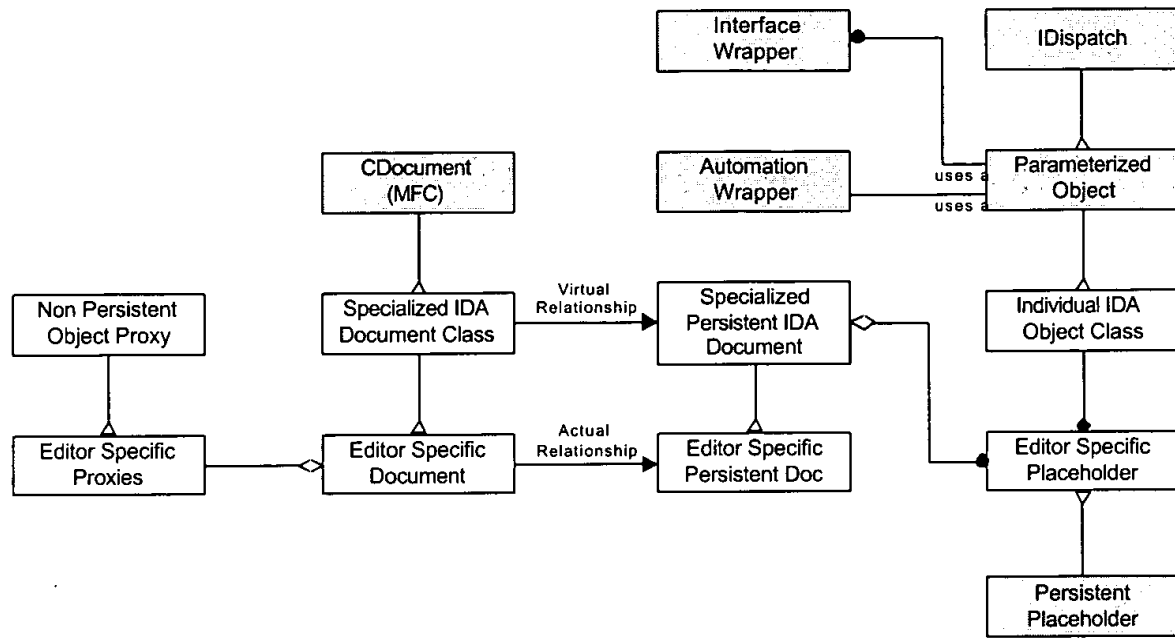


Figure 32 - The IDA Document Architecture

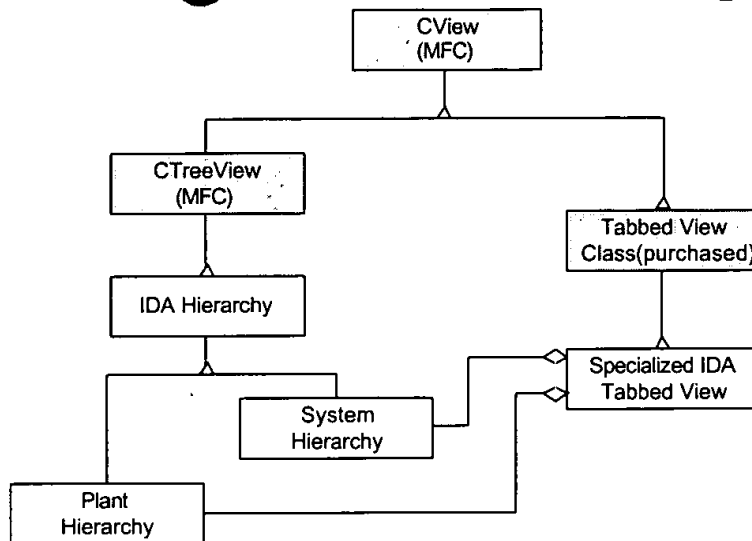


Figure 33 – IDA Hierarchy Classes

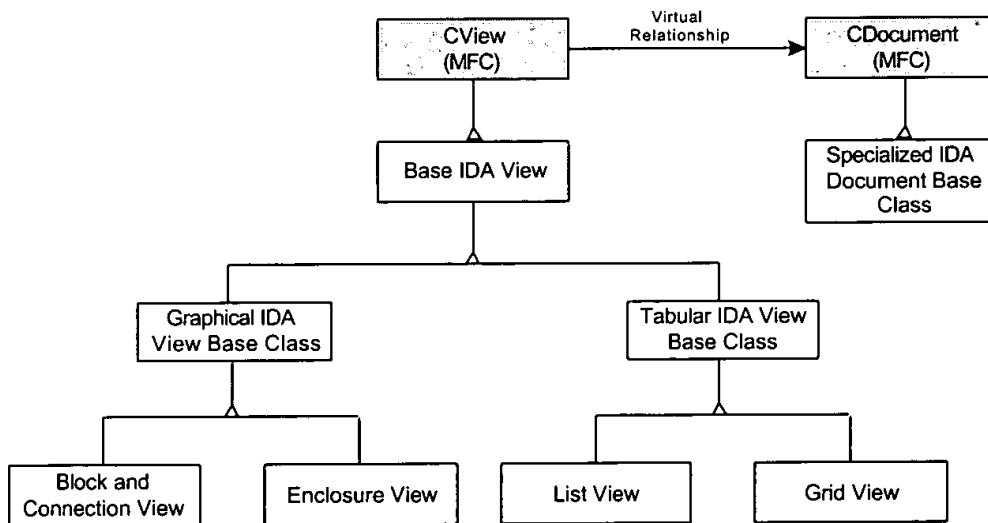


Figure 34 - The IDA View Classes

DocId: 34460

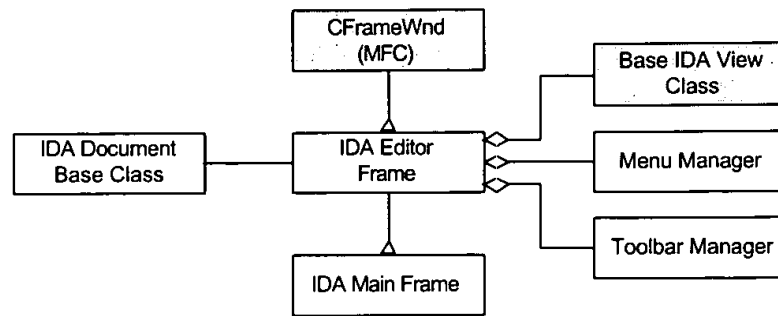


Figure 35 - The IDA Frame Classes

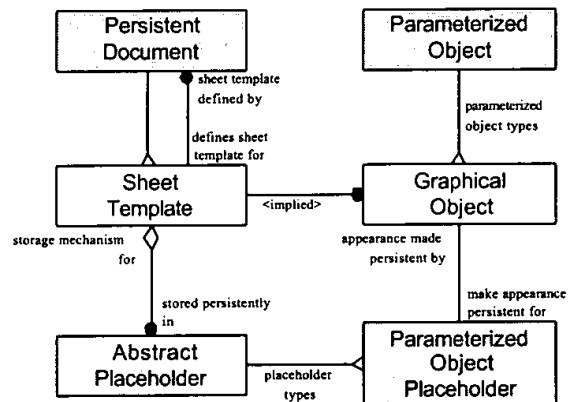


Figure 36 - Sheet Templates Object Model

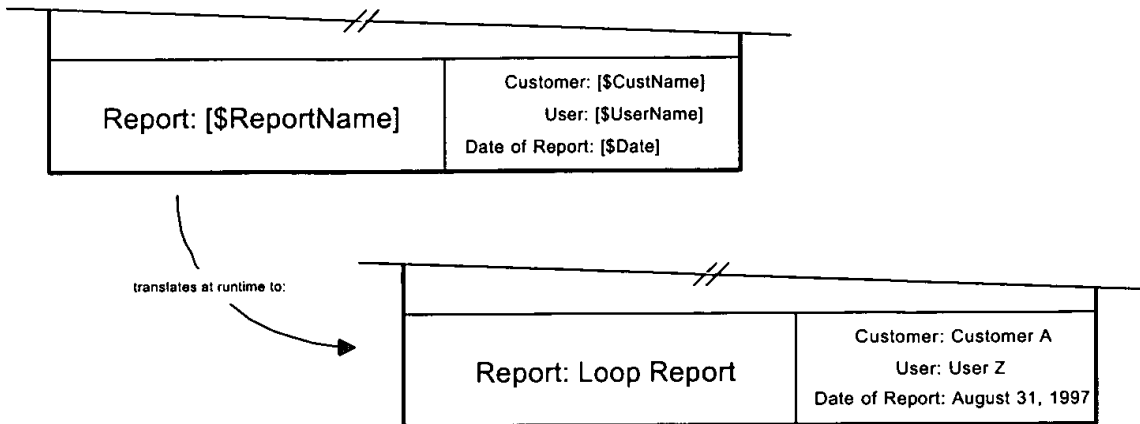


Figure 37 - Sample Use of Macros in Sheet Template

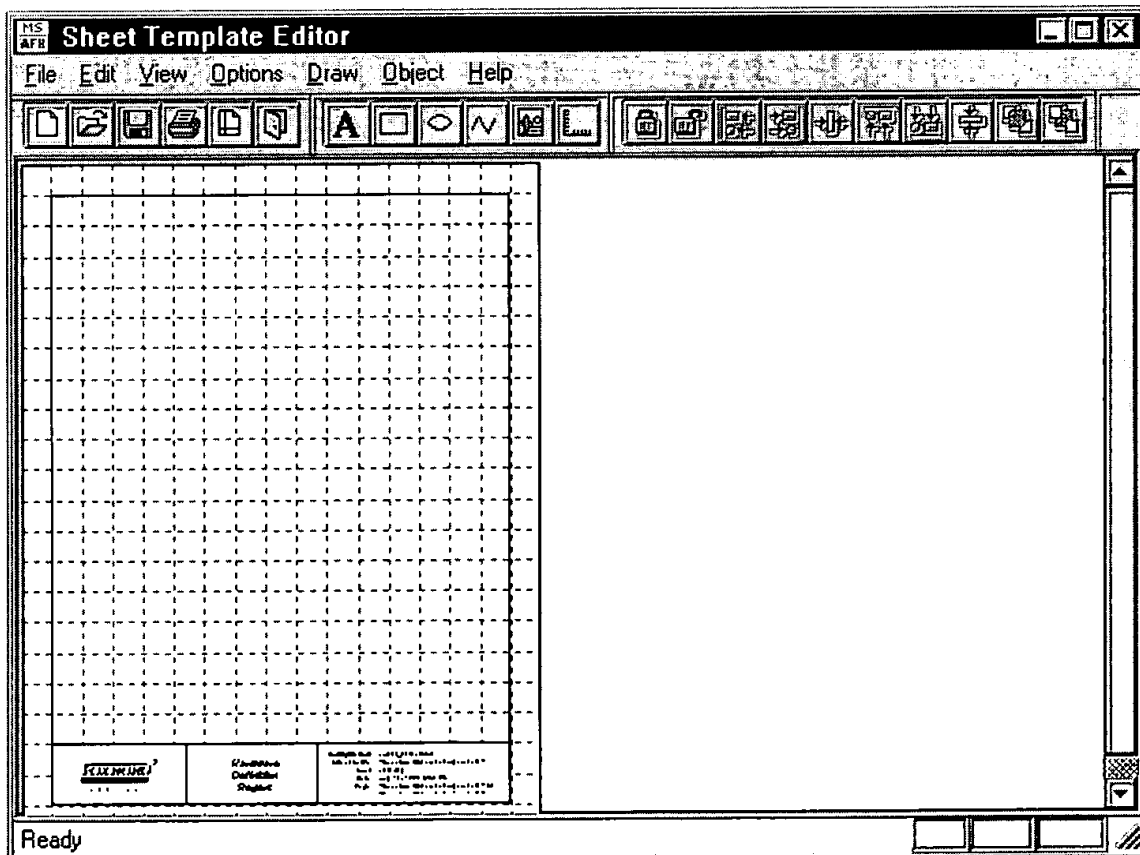


Figure 38 - Sheet Template Editor

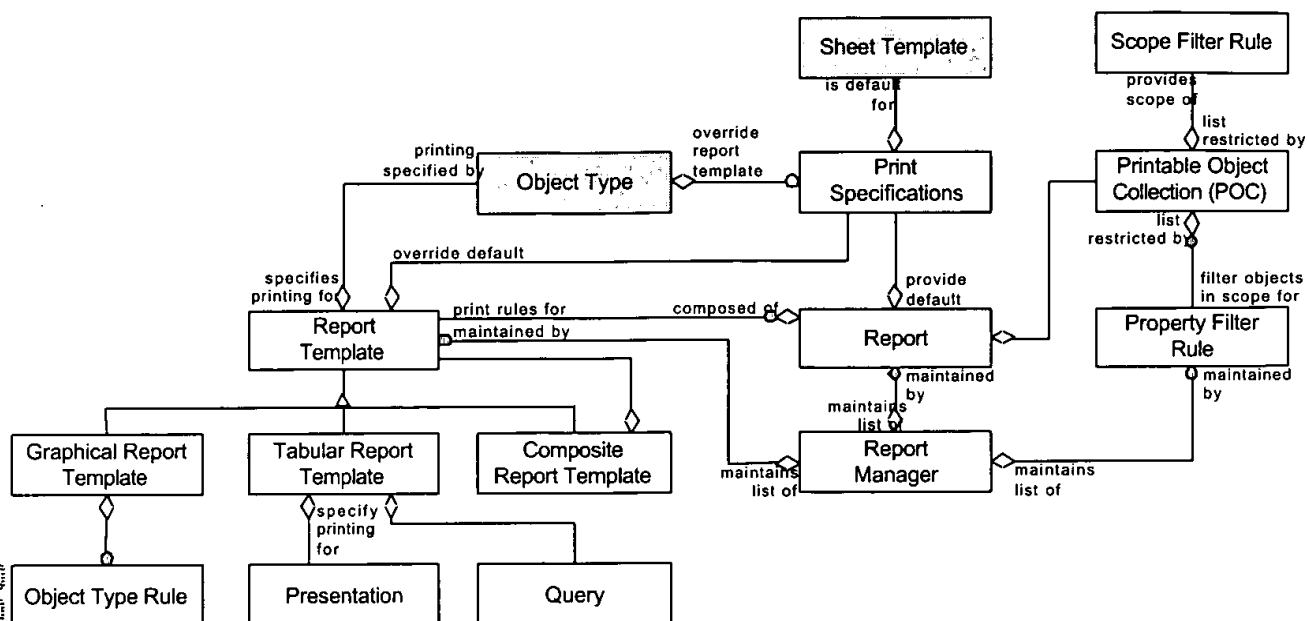


Figure 39 - The IDA Report Manager Object Model

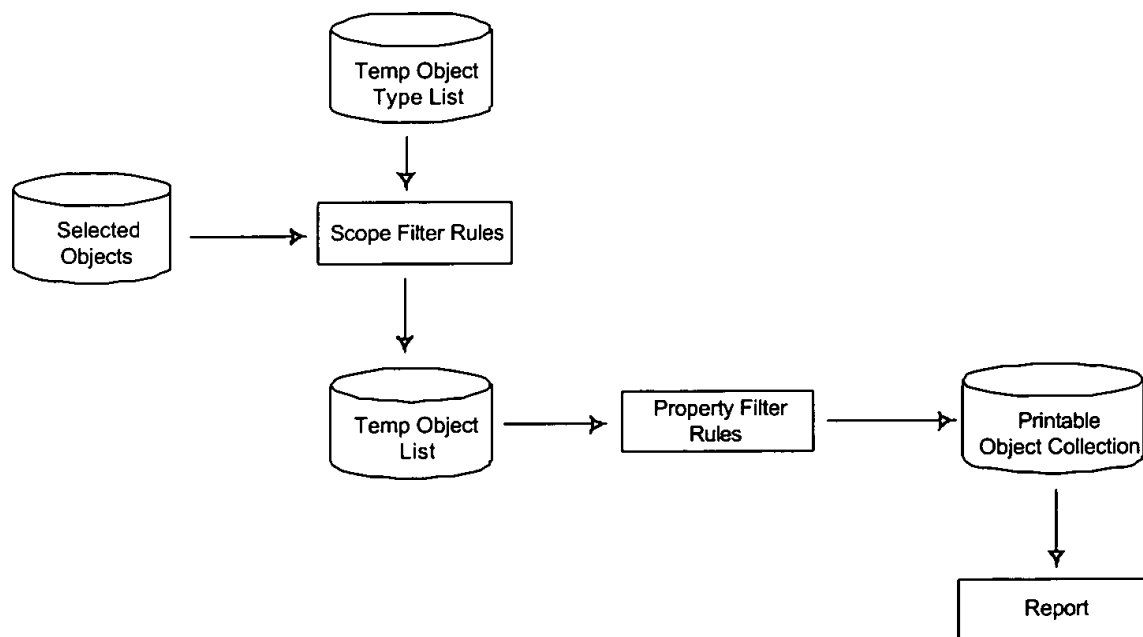


Figure 40 - Applying Filter Rules to POC

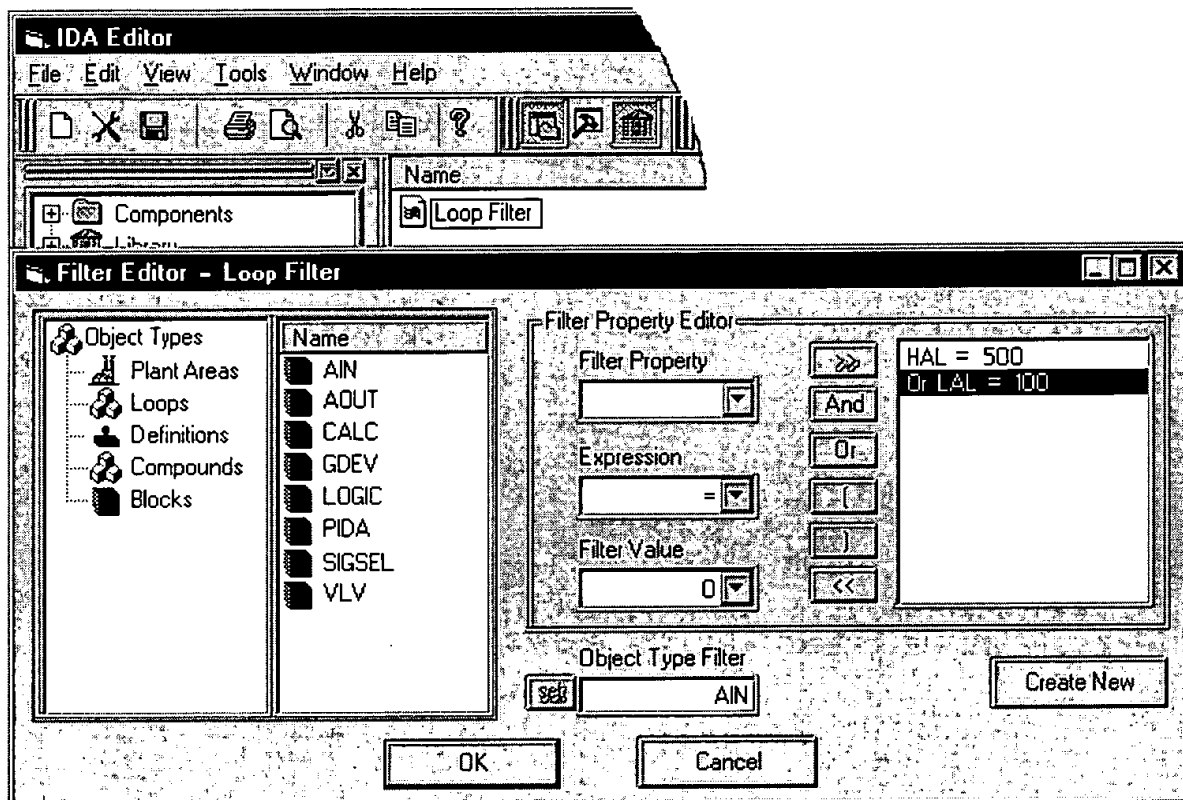


Figure 41 – Filter Editor

SECRET

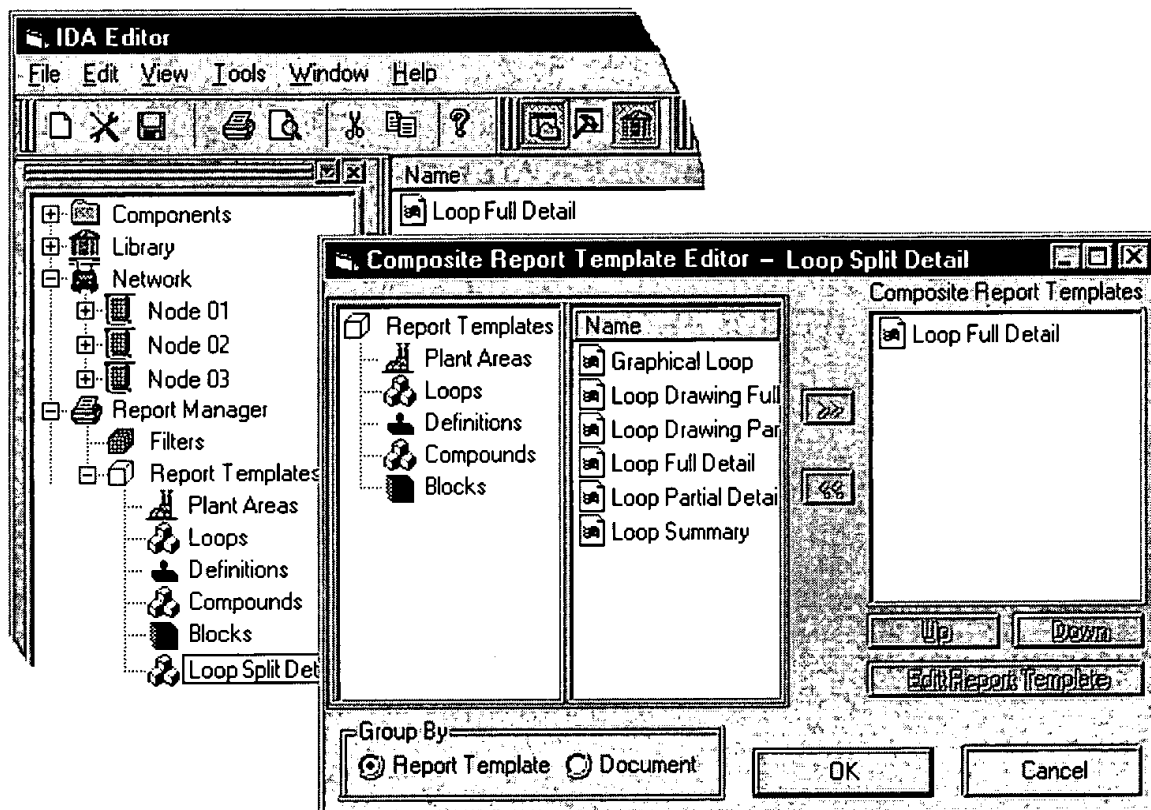


Figure 42 - Composite Report Template Editor

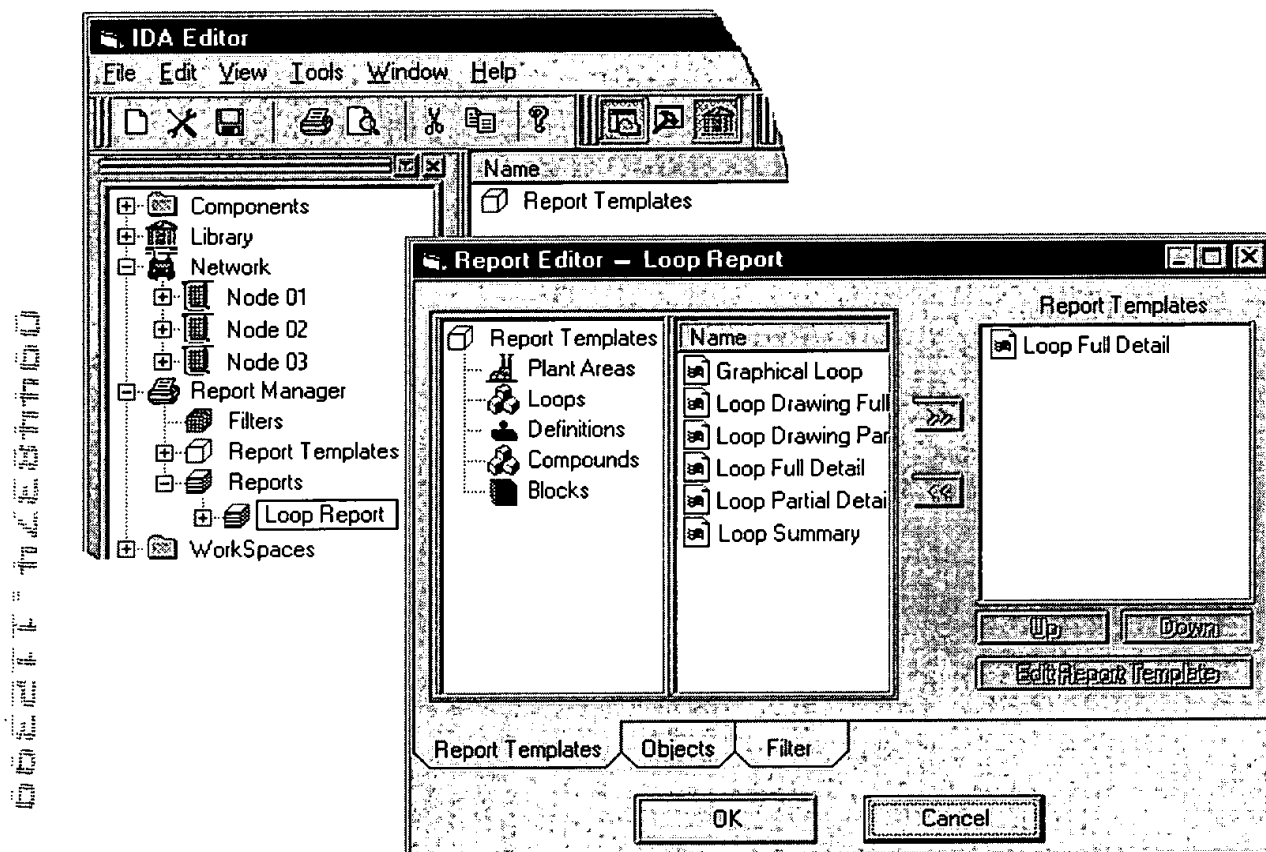


Figure 43 - Report Editor

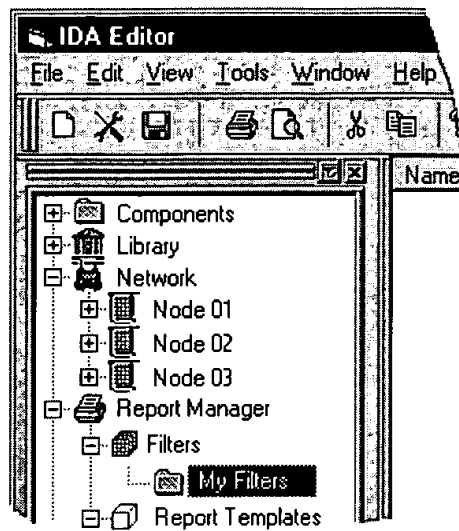


Figure 44 - Organizational Folders

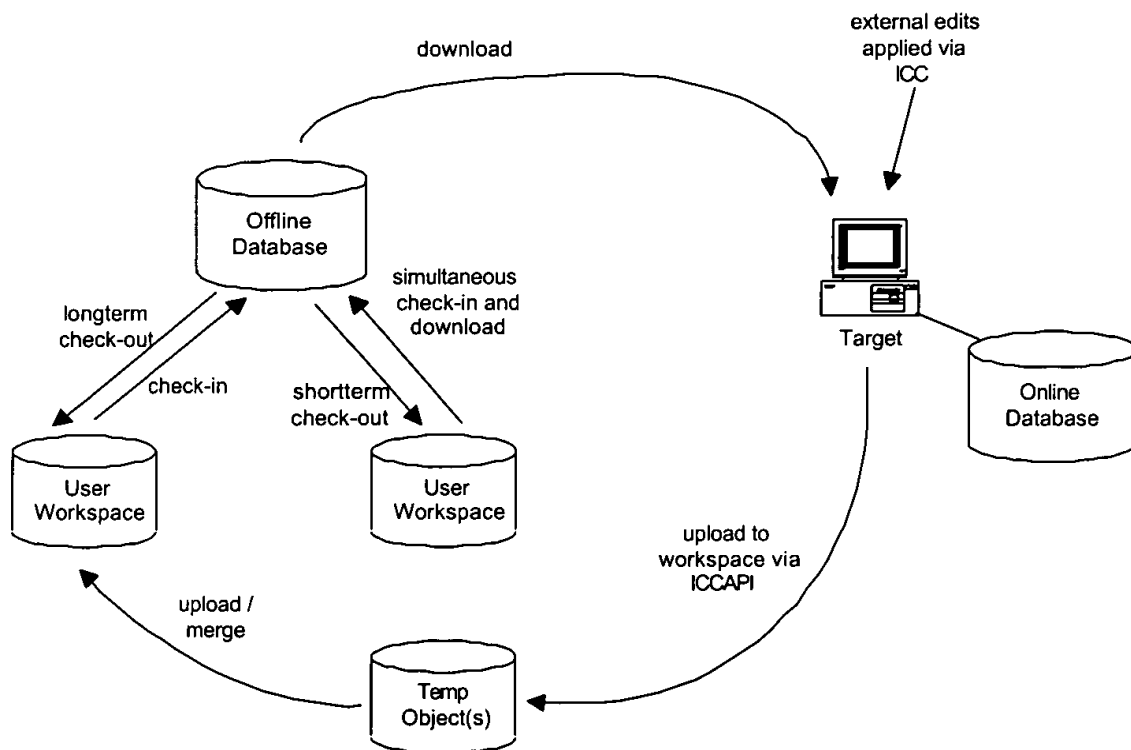


Figure 45 - Version Control - Basic Concepts

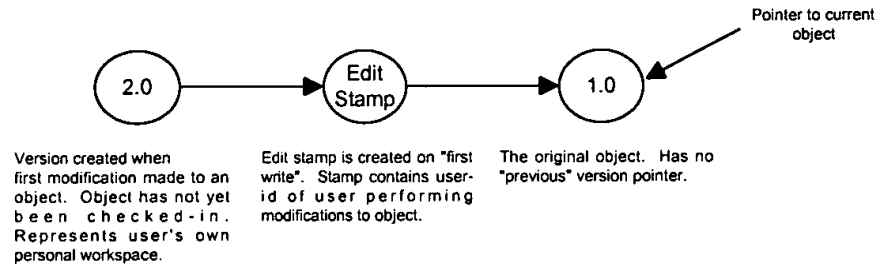


Figure 46 - Object Check-Out

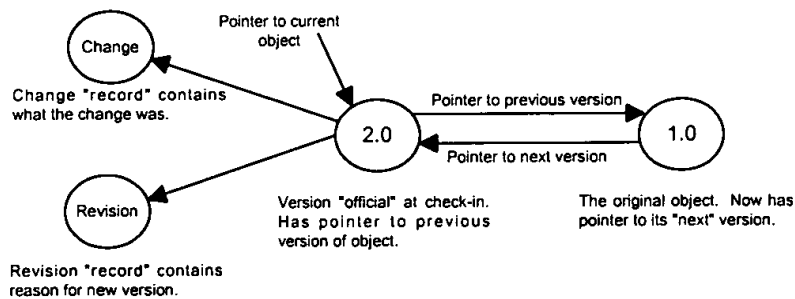


Figure 47 - Object Check-In

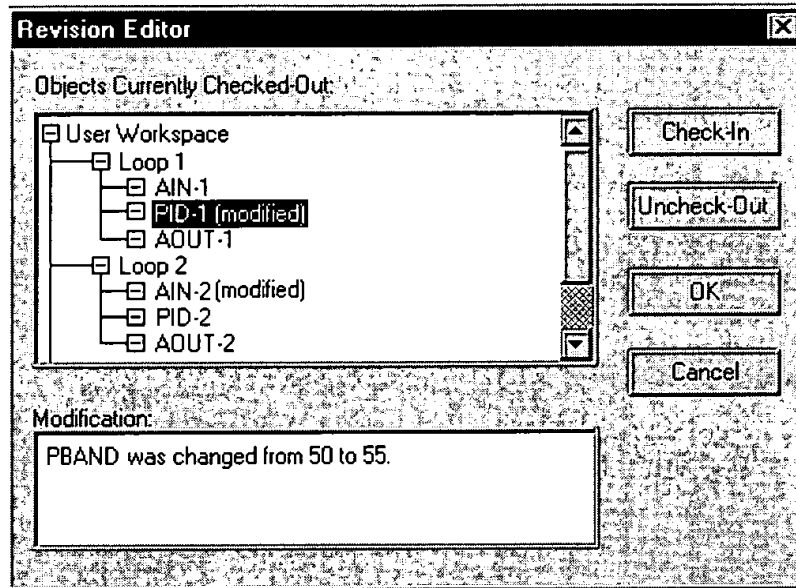


Figure 48 - Revision Editor

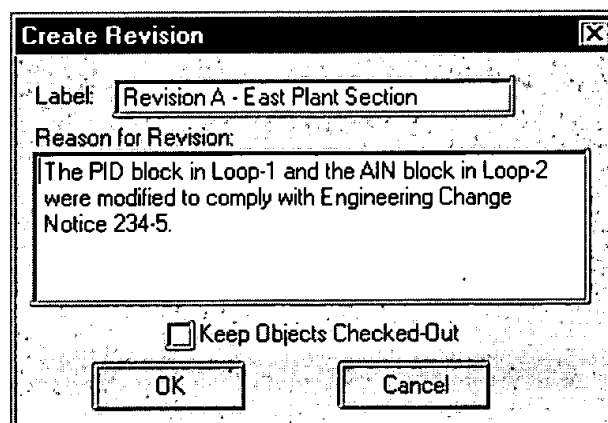


Figure 49 - Create Revision Dialog Box

CONFIDENTIAL

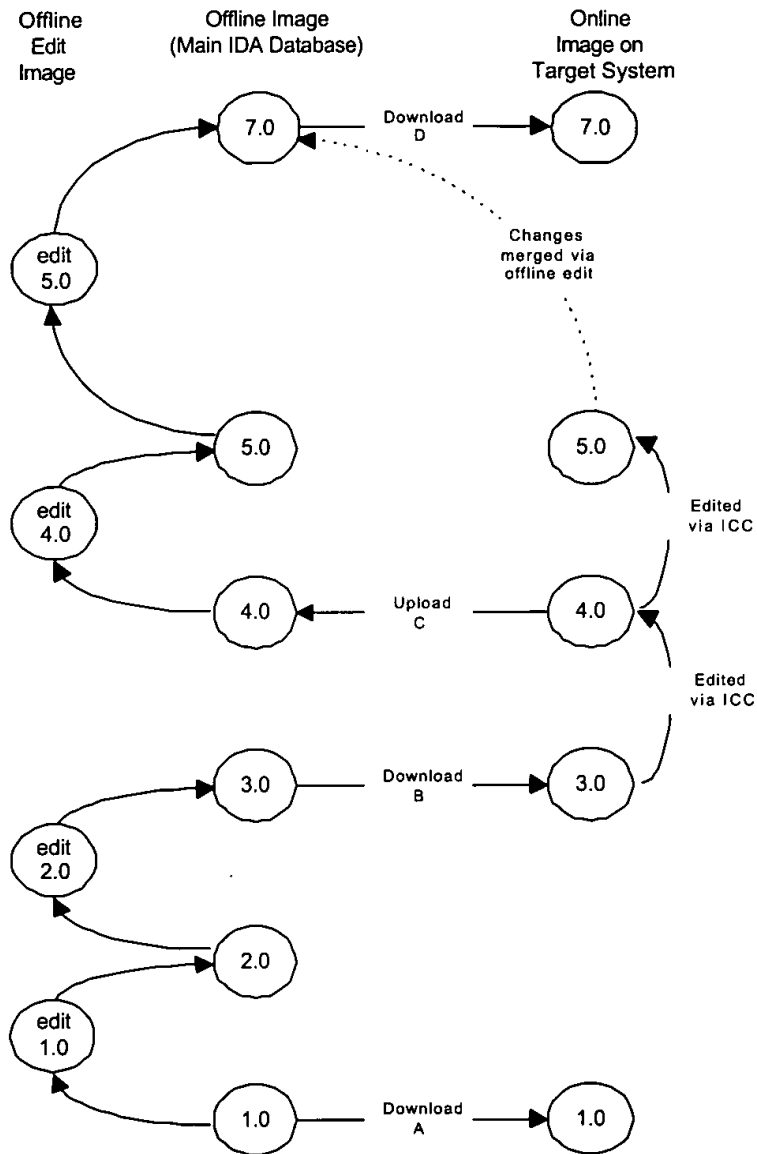


Figure 50 - Parameterized Object Versions

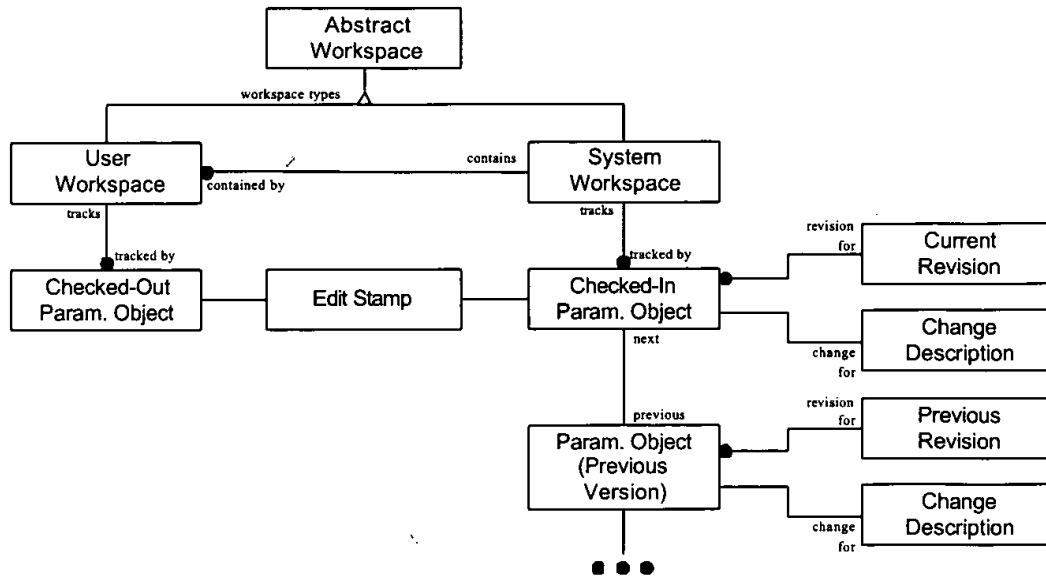


Figure 51 - Version Control Object Model

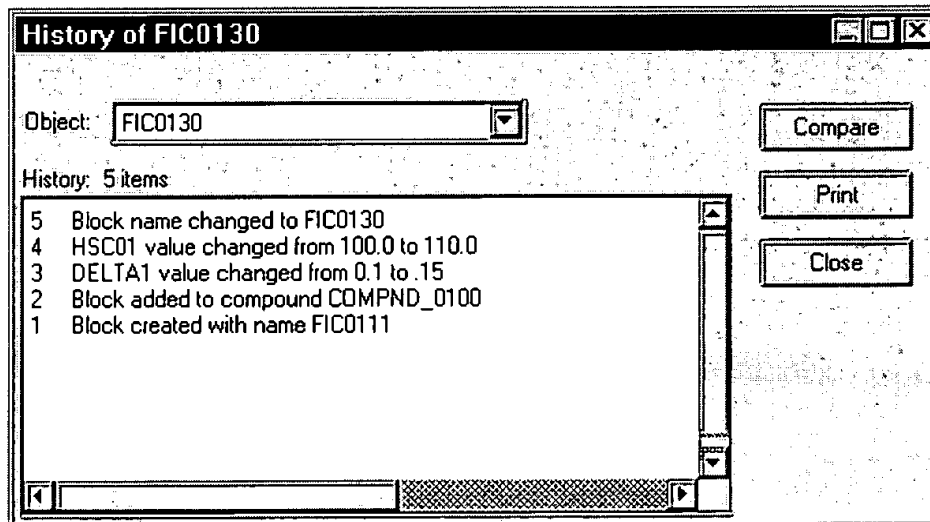


Figure 52 - Version History

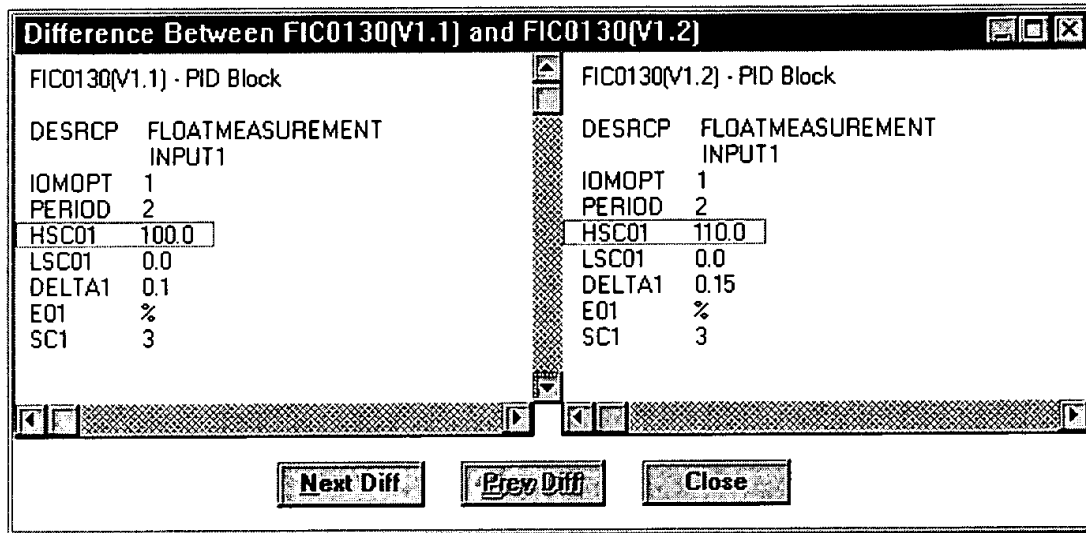


Figure 53 - Object Compare Utility

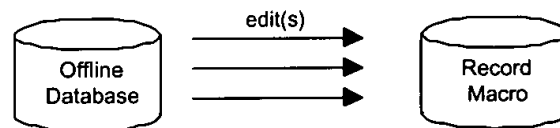


Figure 54 - Historical Archive with Playback Macro

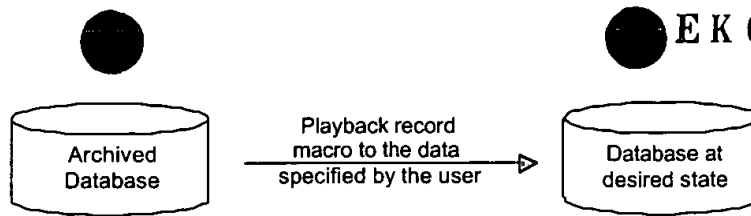


Figure 55 - Performing a Macro Playback

Object: PID2		Object Audit Trail: V1.0 to V1.2		
Version	Date	User	Modification	Reason for Modification
V1.0	09/27/97	MBJ	Object created.	
V1.1	09/29/97	MBJ	PBAND changed from 40 to 50.	FBM added to loop A.
V1.2	10/04/97	JKL	PBAND readjusted to 45.	Finetuning loop parameters.

Figure 56 - Sample Audit Trail Report

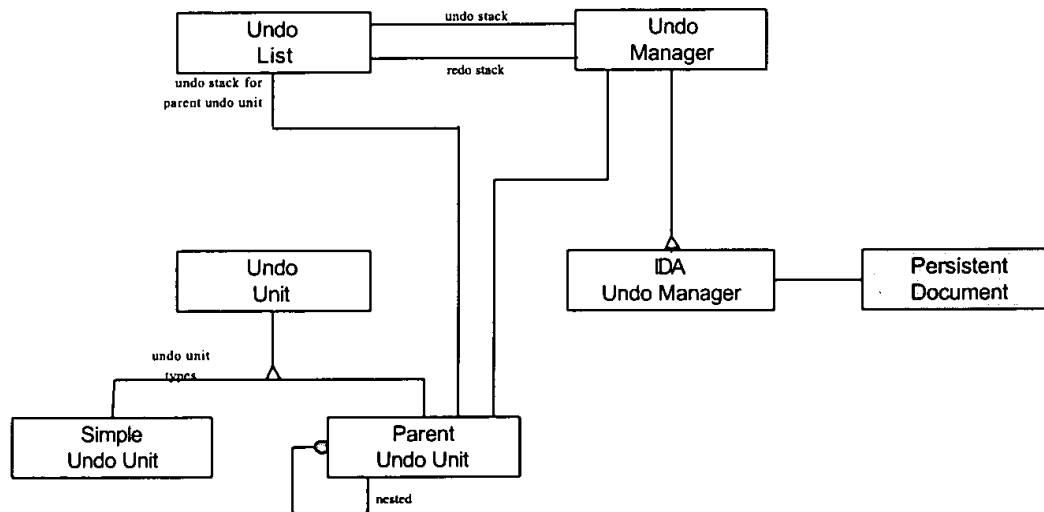


Figure 57 - Undo Manager Object Model

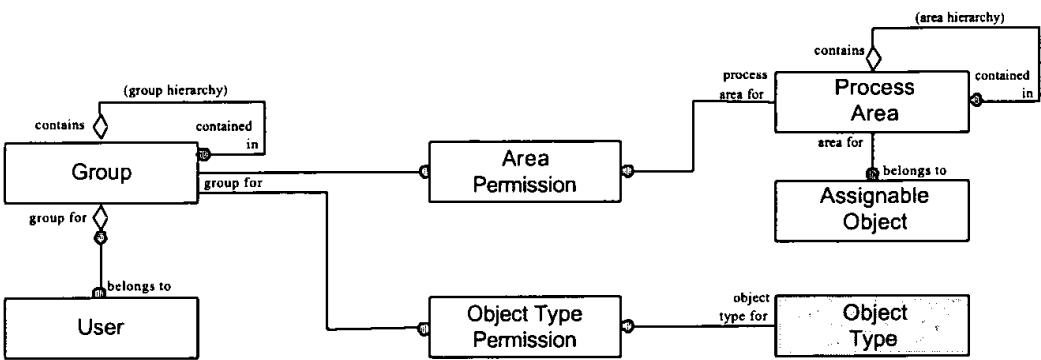


Figure 58 - Users and Security Object Model

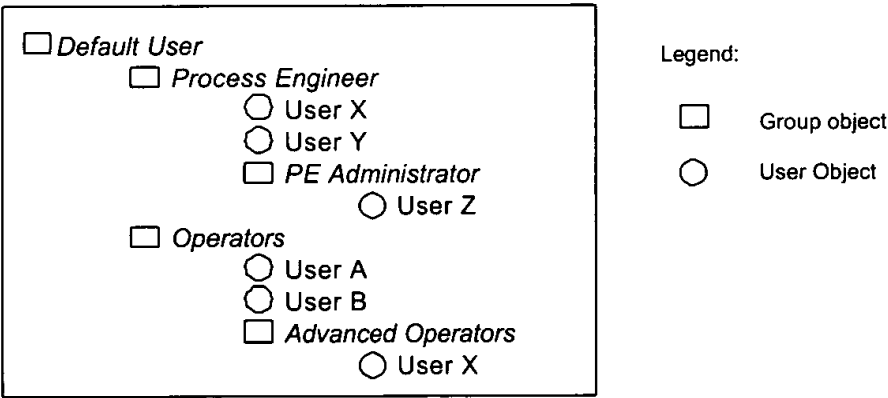


Figure 59 - Users and Groups Example

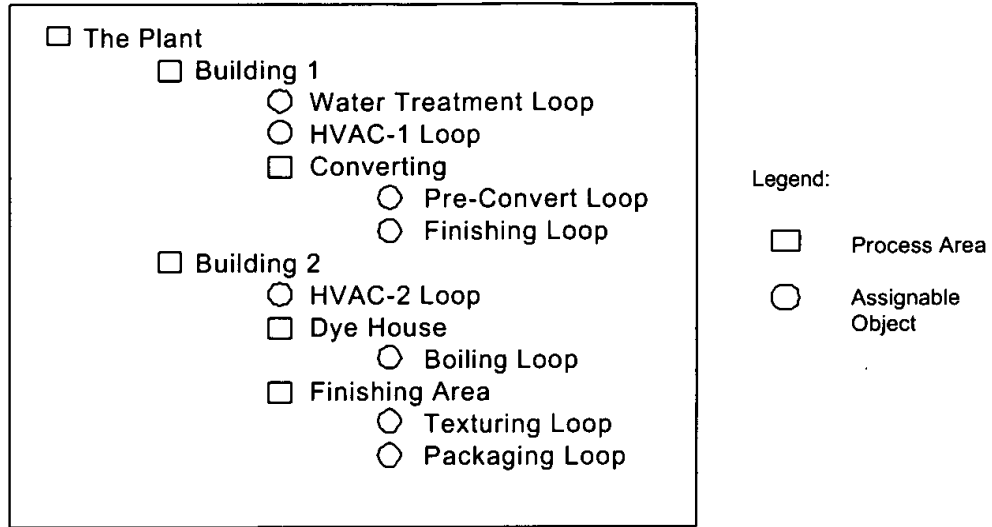


Figure 60 - Process Area and Assignable Objects Example

SECRET - UNCLASSIFIED

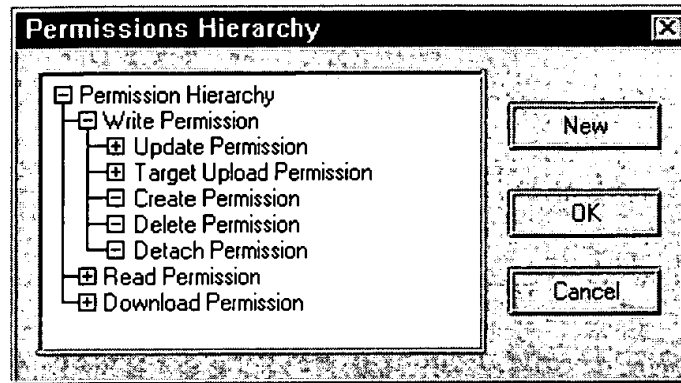


Figure 61 - IDA Permissions Hierarchy

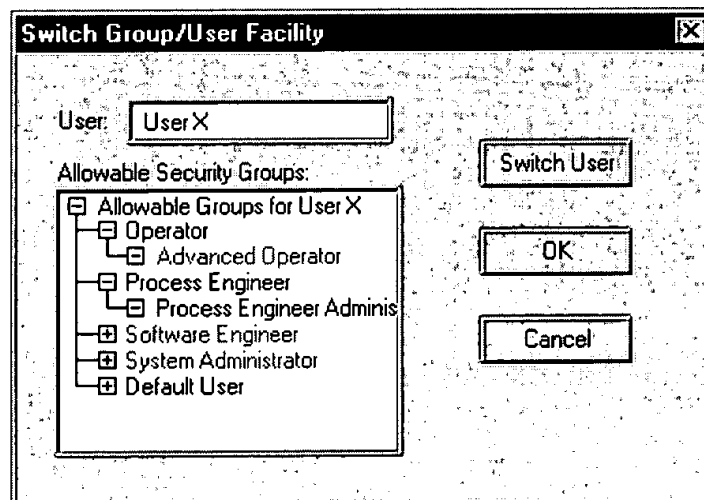
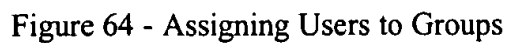
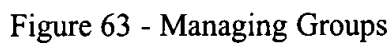


Figure 62 - Switch Group/User Capability



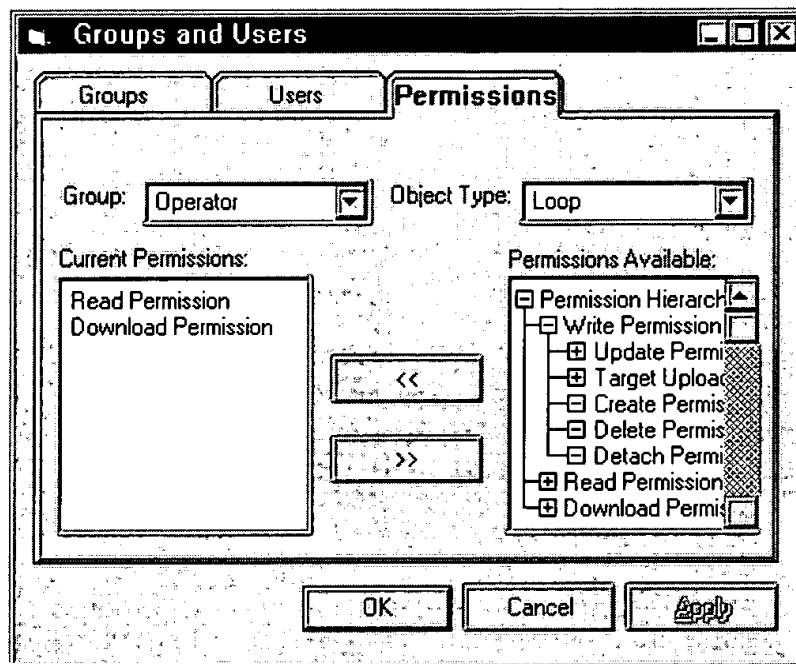


Figure 65 - Groups, Object Types and Permissions

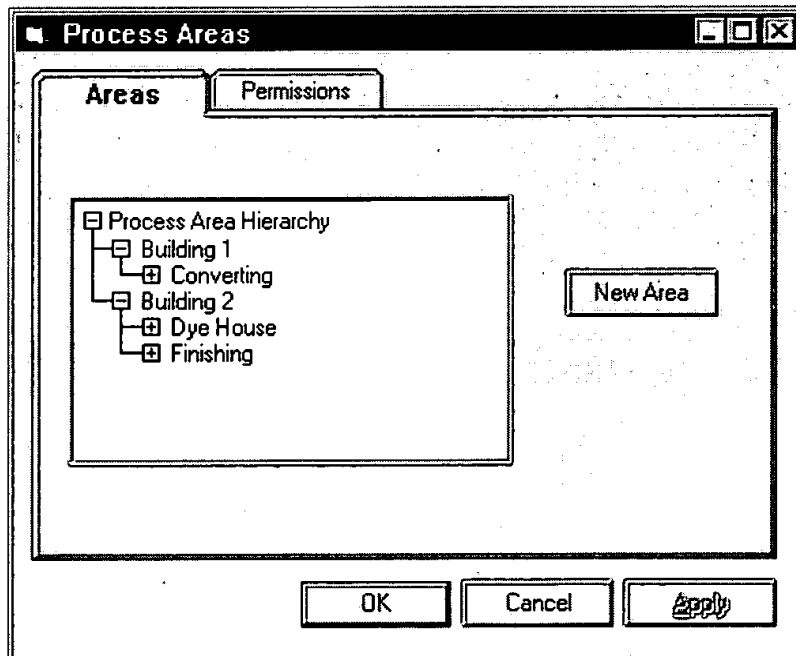


Figure 66 - Managing Process Areas

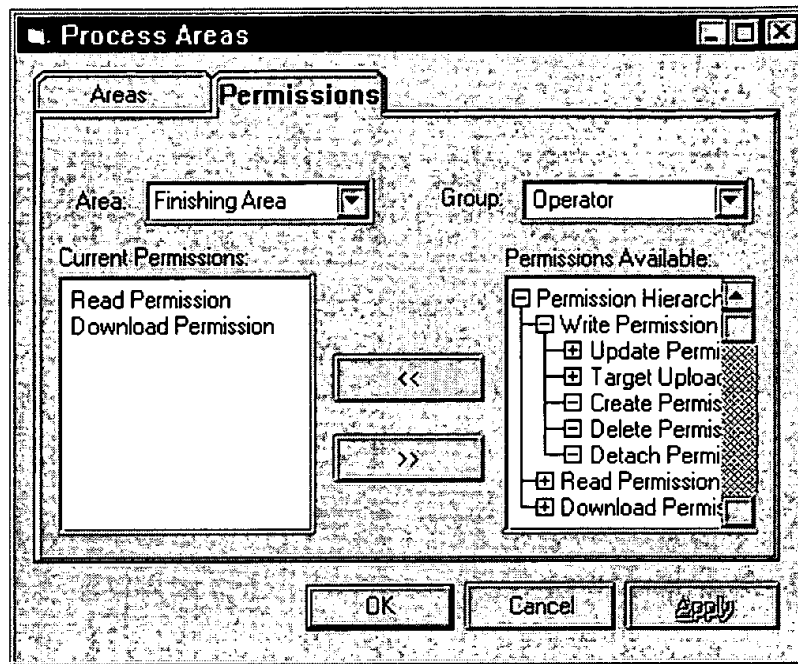


Figure 67 - Groups and Process Area Permissions

SECRET - TELETYPE

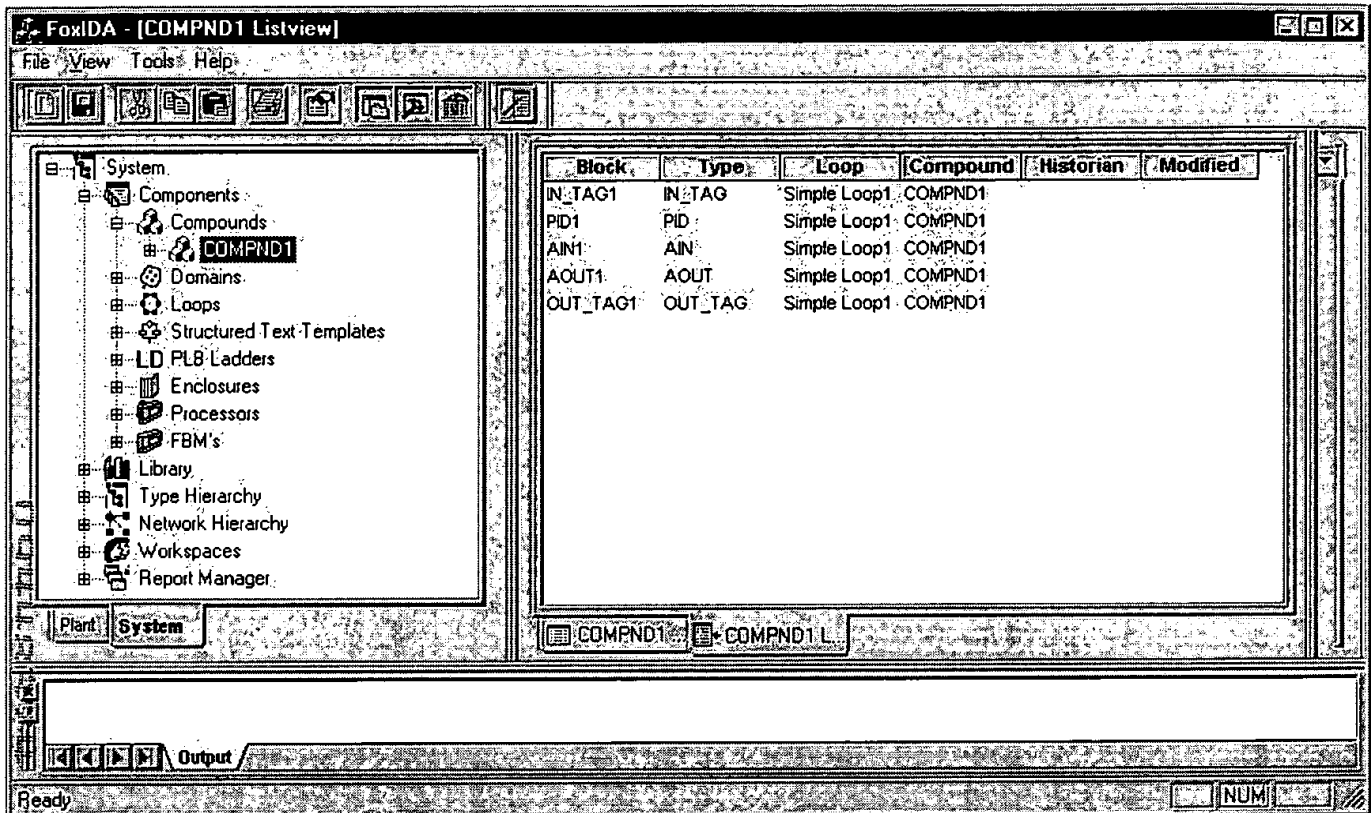


Figure 68 - System TreeView

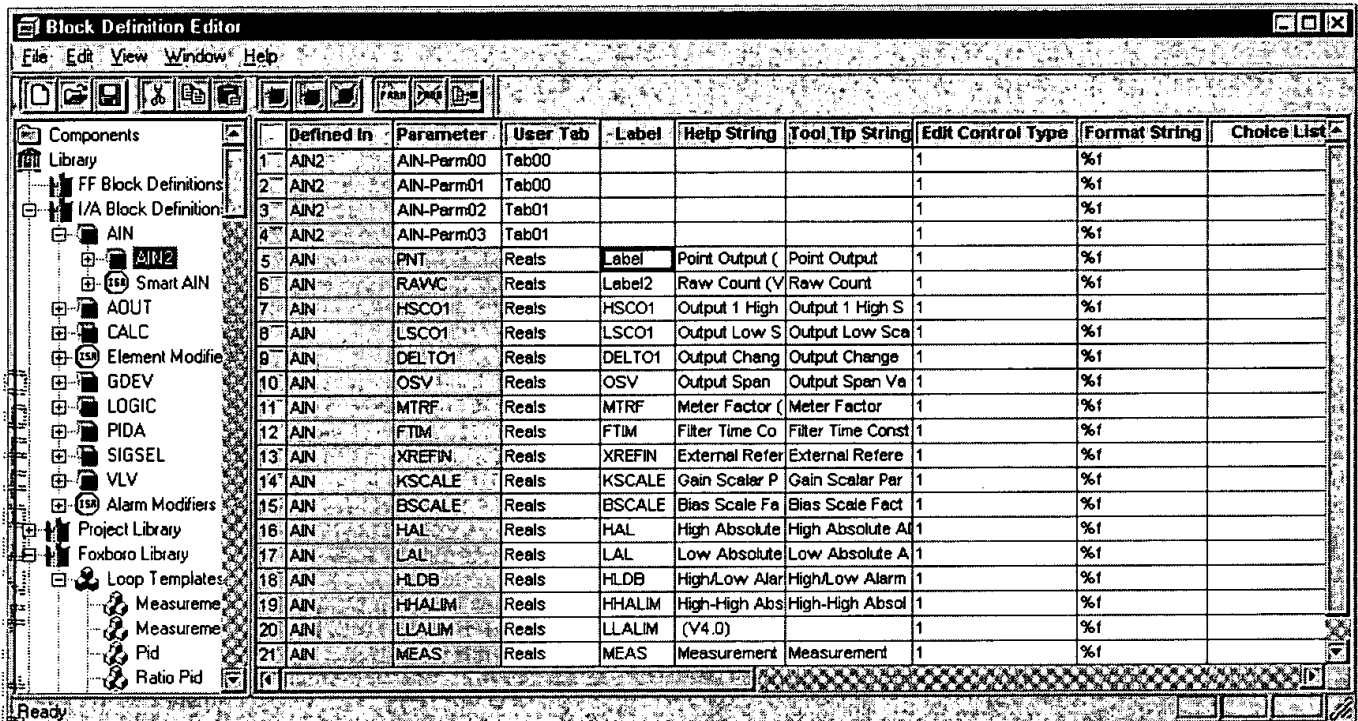


Figure 69 - Block Definition Editor

SECRET: NOFORN

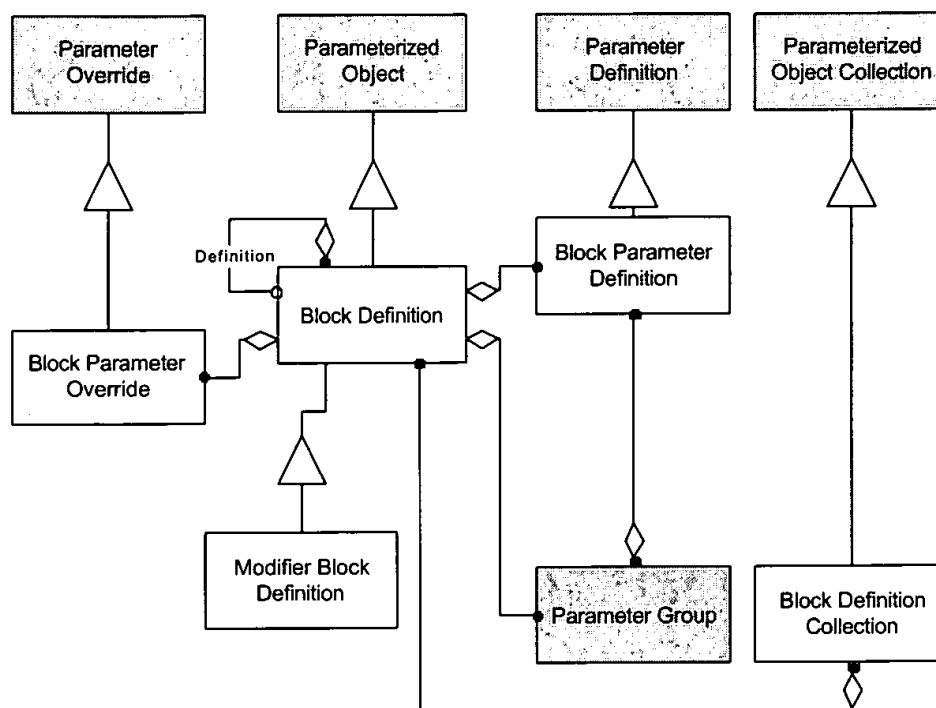


Figure 70. Block Definition Classes.

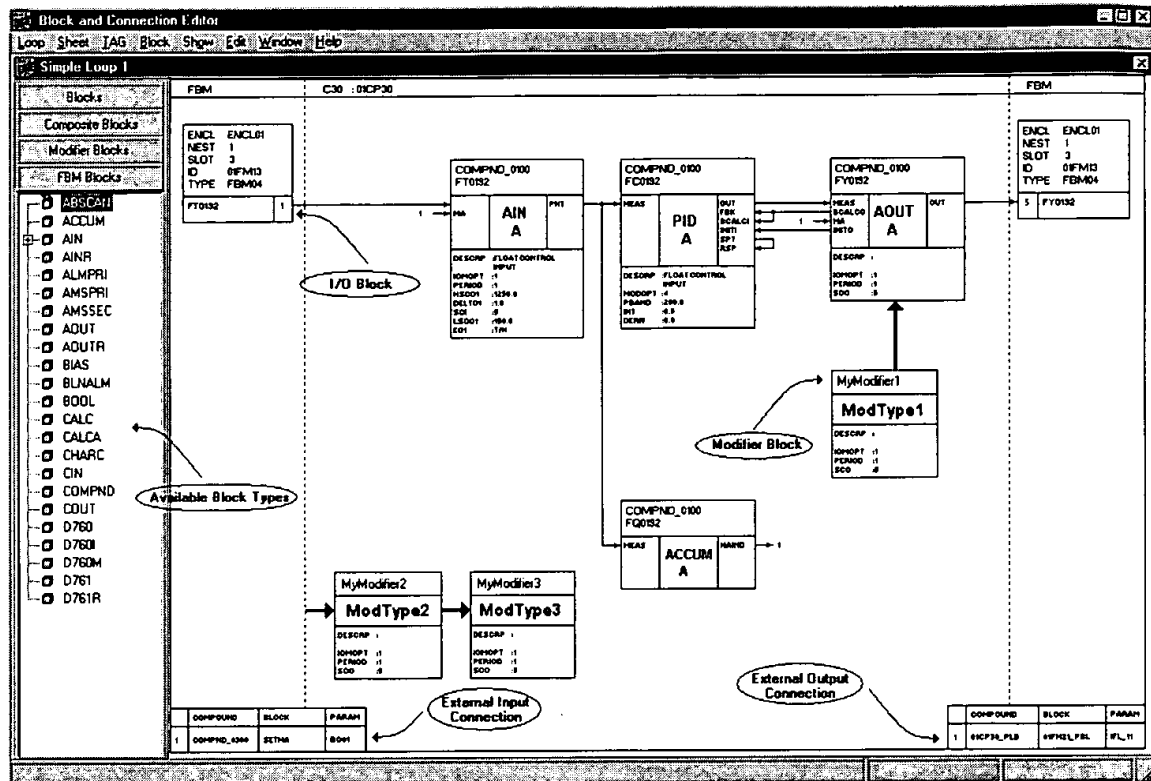


Figure 71 - Simple Loop

Block and Connection Editor

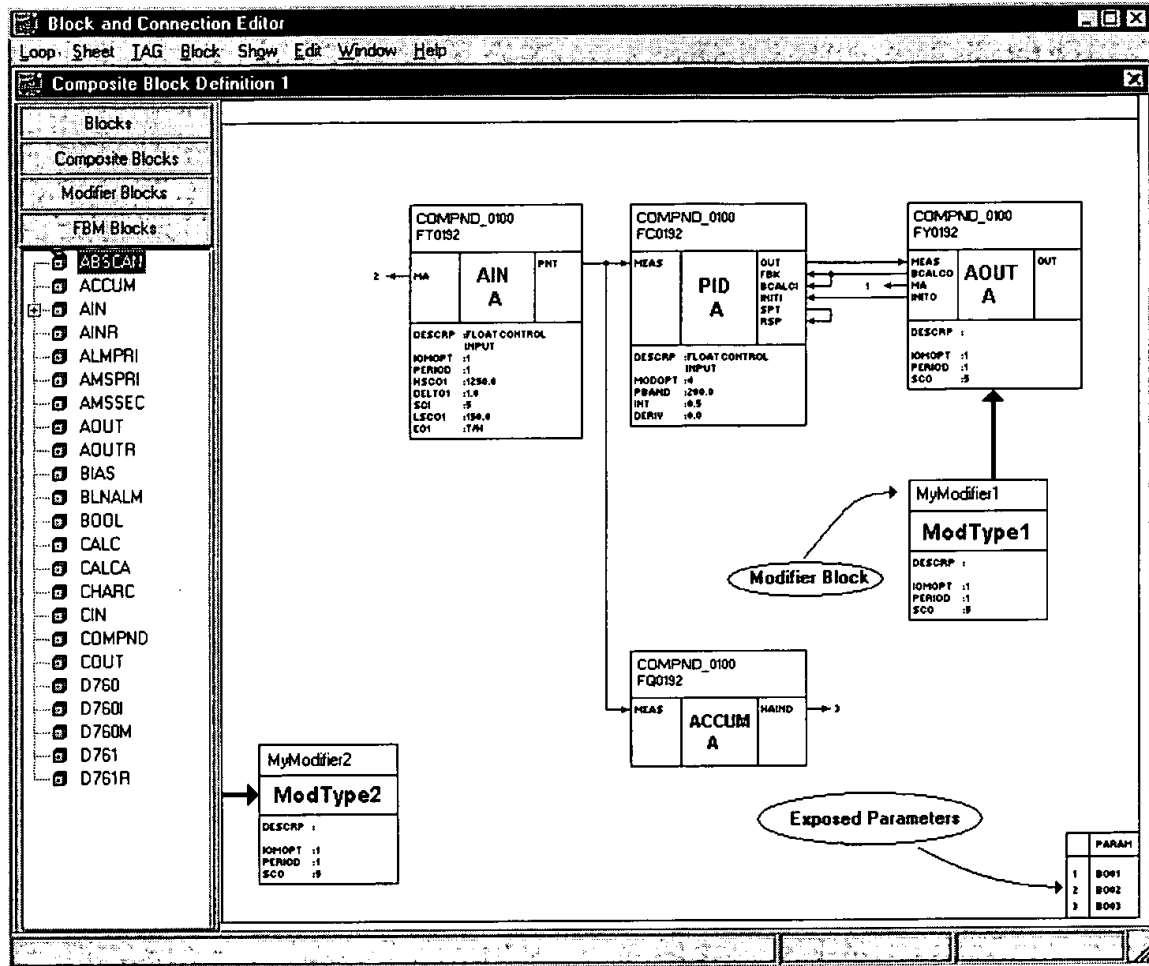


Figure 72 - Composite Block Definition

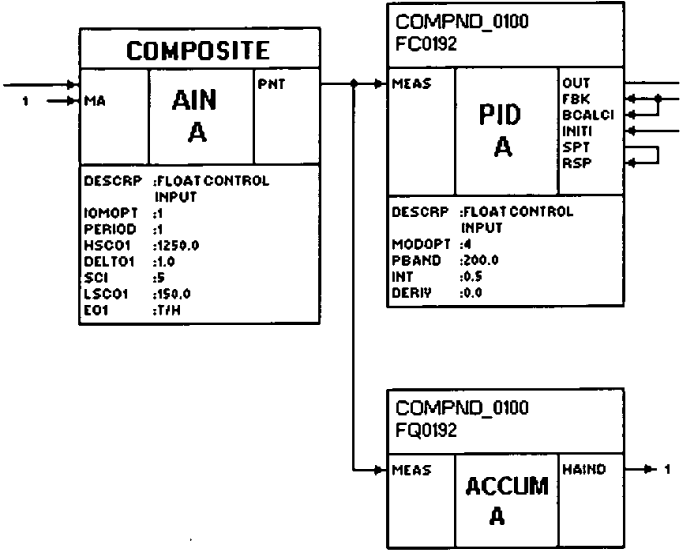


Figure 73 - Composite Block In Loop

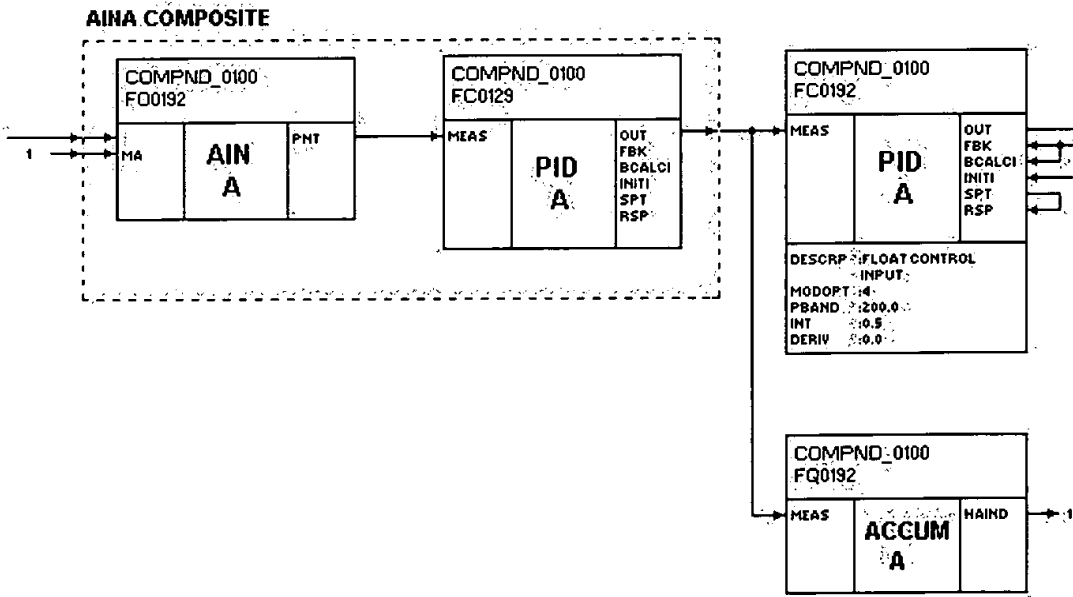


Figure 74 - Expanded Composite Block In Loop

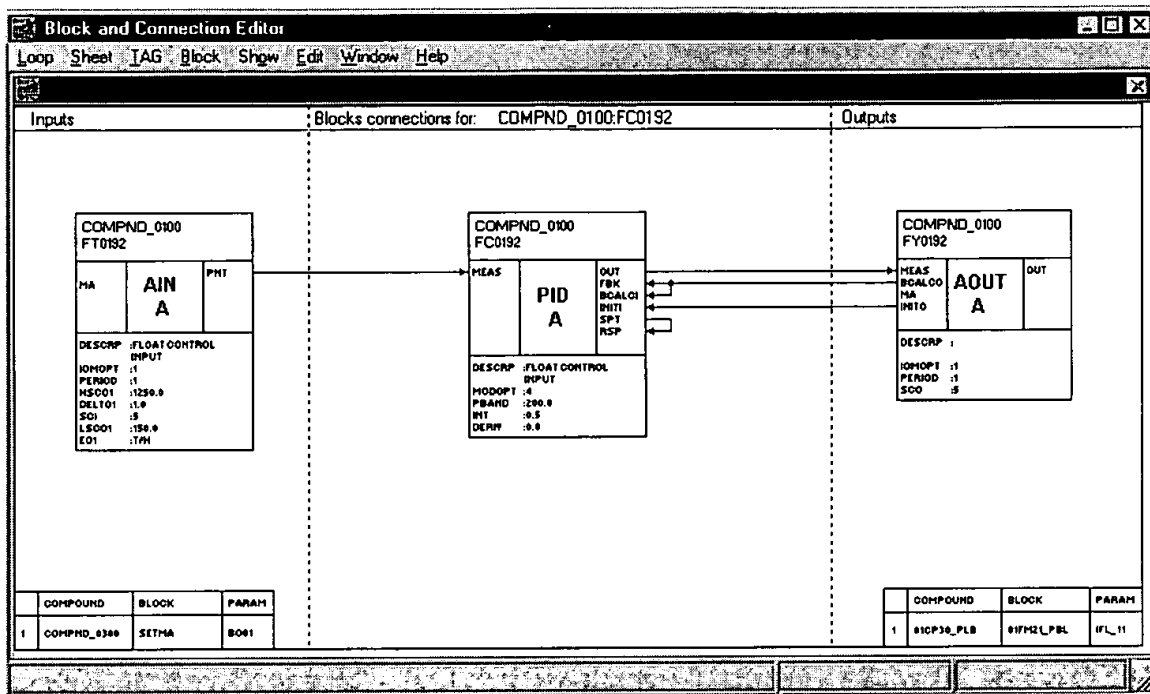


Figure 75 - Block with Connections

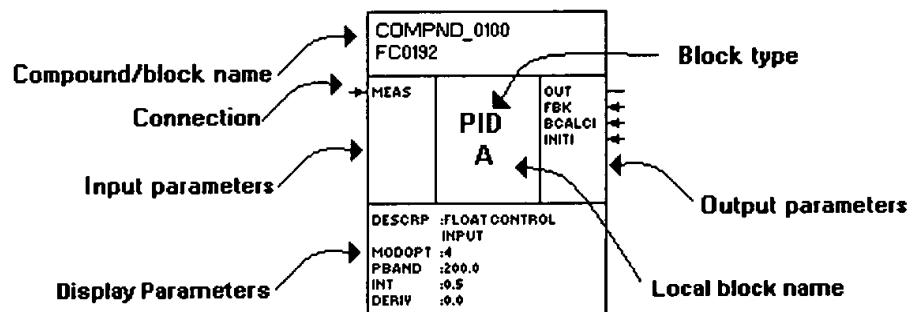


Figure 76 - Anatomy of a Block Placeholder

Figure 77 - Block Connection dialog

Figure 78 - Template/Definition Internal Connections

Param CIN_1	<input type="radio"/> Connect To: <input checked="" type="radio"/> Expose As: CIN_1	
----------------	---	--

Figure 79 - Template/Definition Exposed Connections

MYAIN

Reals

PNT	0.000000
RAWC	0.000000
HSC01	100.000000
LSC01	0.000000
DELTO1	1.000000
OSV	2.000000
MTRF	1.000000
FTIM	0.000000
XREFIN	0.000000
KSCALE	1.000000
BSCALE	0.000000
HAL	100.000000
LAL	0.000000
HLDB	0.000000
HHALIM	100.000000
LLALIM	0.000000
MEAS	0.000000

Value: $f(x)$ my.LSC01 + 100.0

OK Cancel Apply Help

Figure 80 - Parameter Property Sheet

MYAIN

Parameters for block: BLOCK2

Reals

PNT	0.00000
RAWC	0.00000
HSC01	100.000000
LSC01	0.000000
DELTO1	1.000000
OSV	2.000000
MTRF	1.000000
FTIM	0.000000
XREFIN	0.000000
KSCALE	1.000000
BSCALE	0.000000
HAL	100.000000
LAL	0.000000
HLDB	0.000000
HHALIM	100.000000
LLALIM	0.000000
MEAS	0.000000

Value: $f(x)$ my.LSC01 + 100.0

OK Cancel Apply Help

Figure 81 - Composite Block Property Sheet

Value: $f(x) = LSC01 + 100.0$

Objects:	Parameters:	Functions:
Block	DELT01	SetDelta()
Compound	HAL	SetName()
Loop	HHALIM	SetTag()
Source	HSC01	
Tag	KSCALE	
	LAL	
	LLALIM	
	LSC01	
	MEAS	
	PNT	

Figure 82 - Parameter Formula Builder

SECRET - UNCLASSIFIED

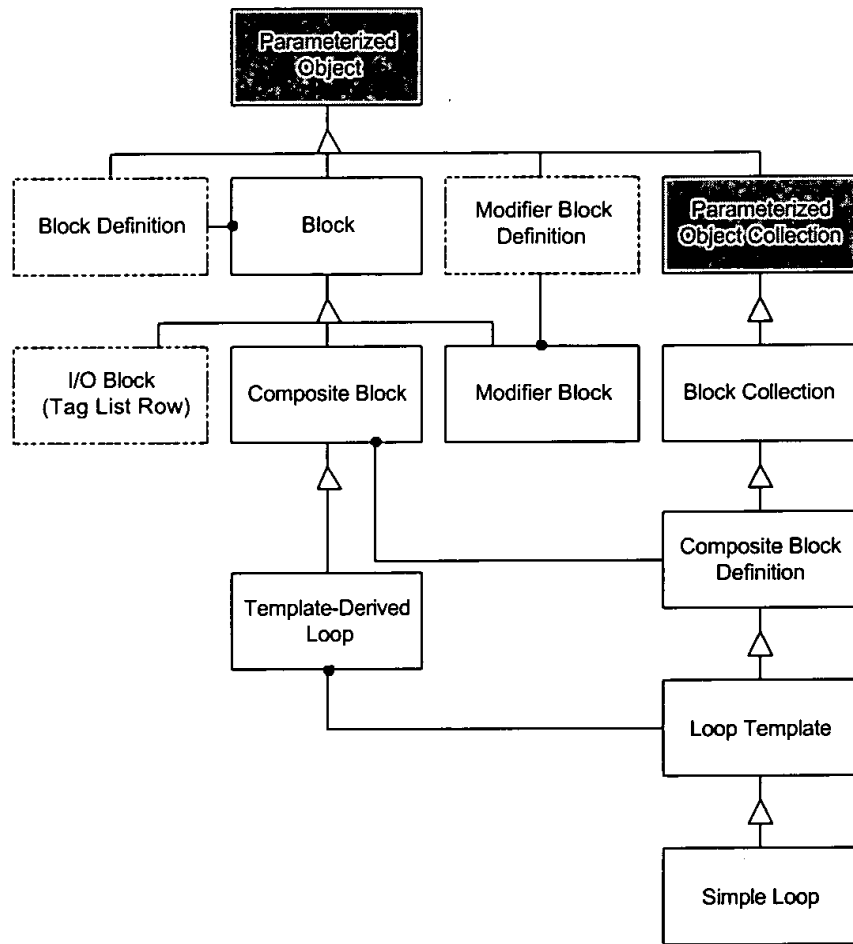


Figure 83 - Control Object derivations

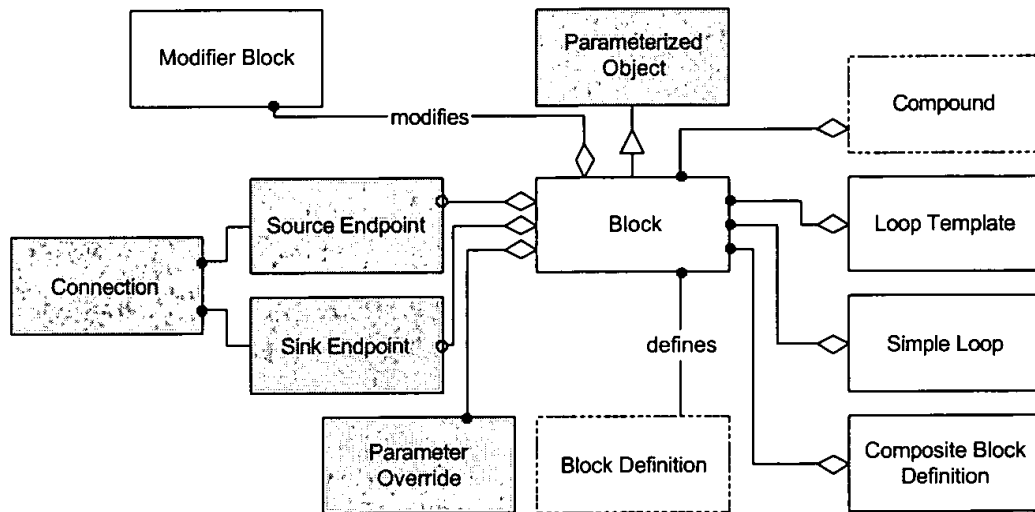


Figure 84 - Block object model

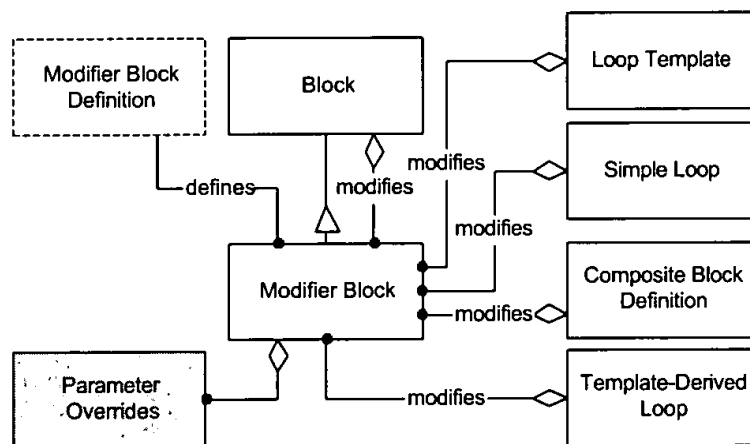


Figure 85 - Modifier Block object model

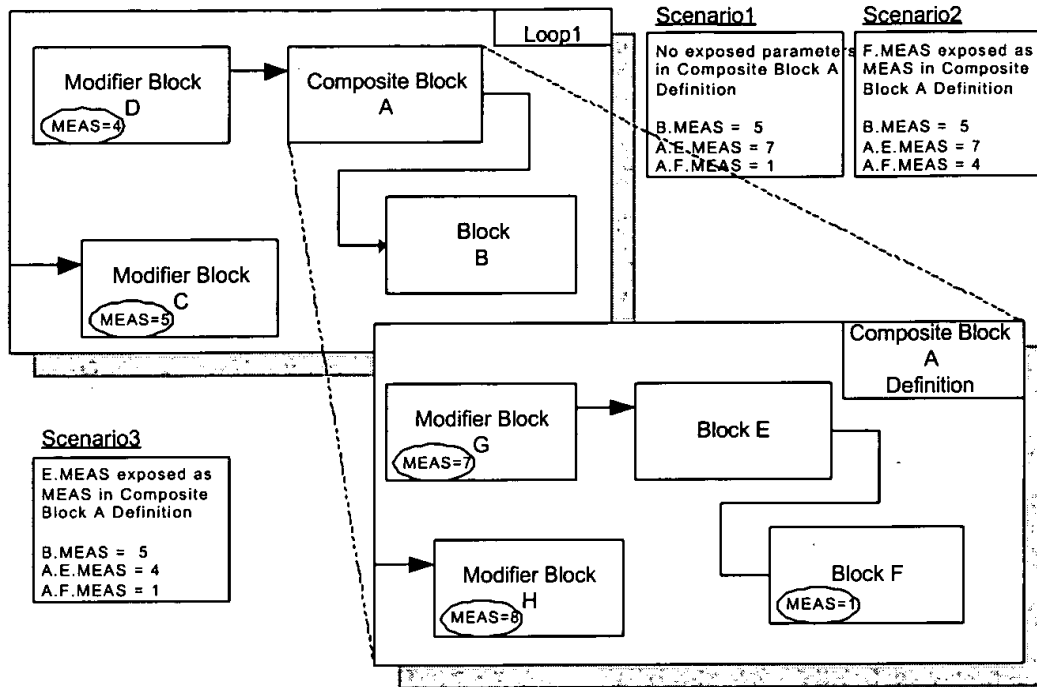


Figure 86 - Modifier Block Parameter override precedence

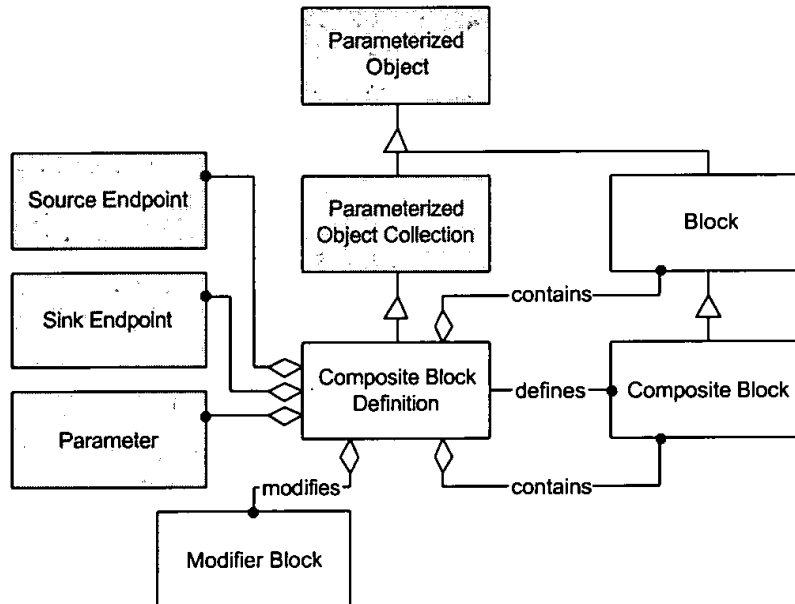


Figure 87 - Composite Block Definition object model

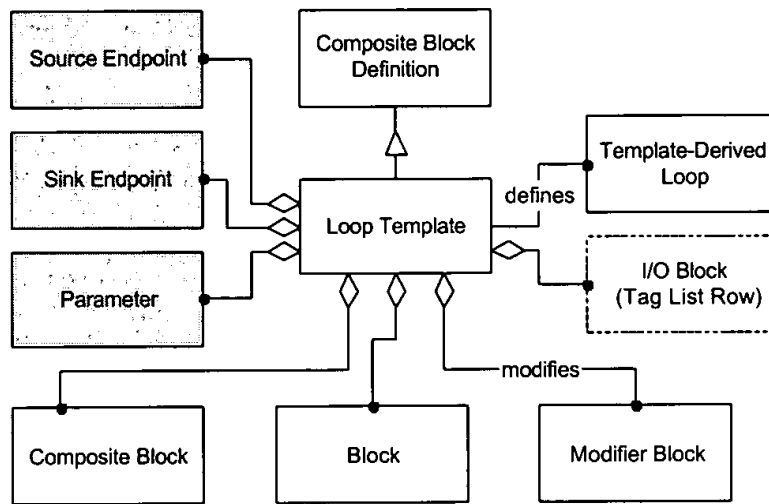


Figure 88 - Loop Template object model

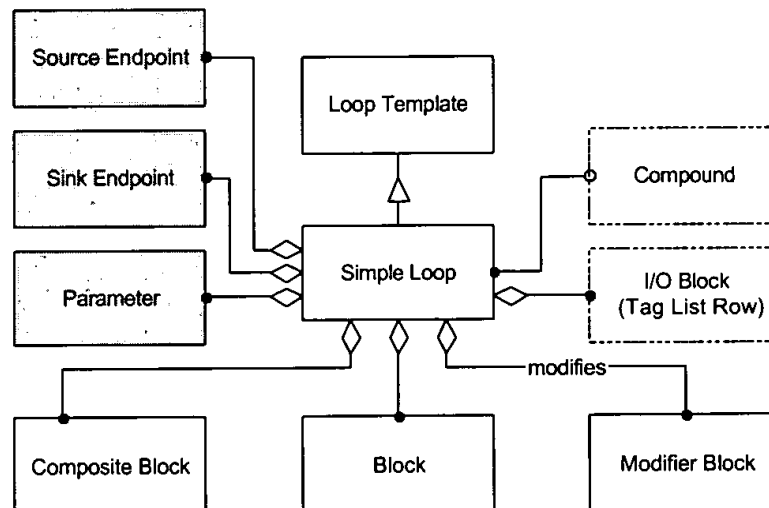


Figure 89 - Simple Loop object model

SECRET - NOFORN

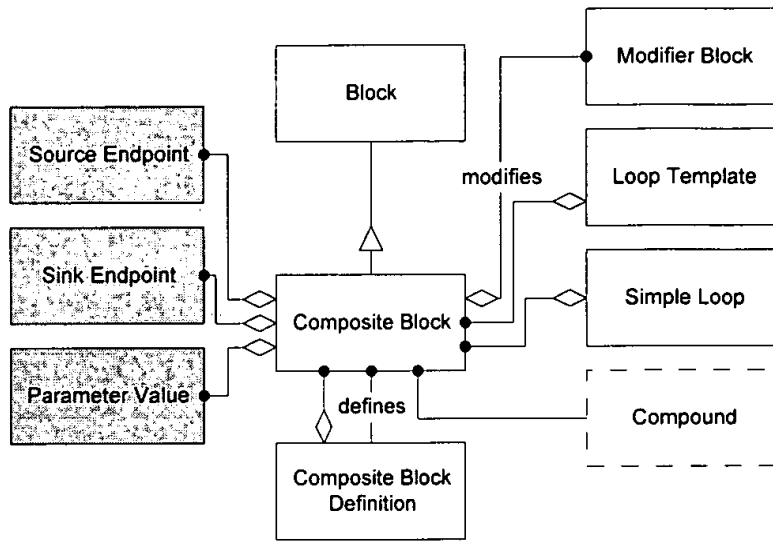


Figure 90 - Composite Block object model

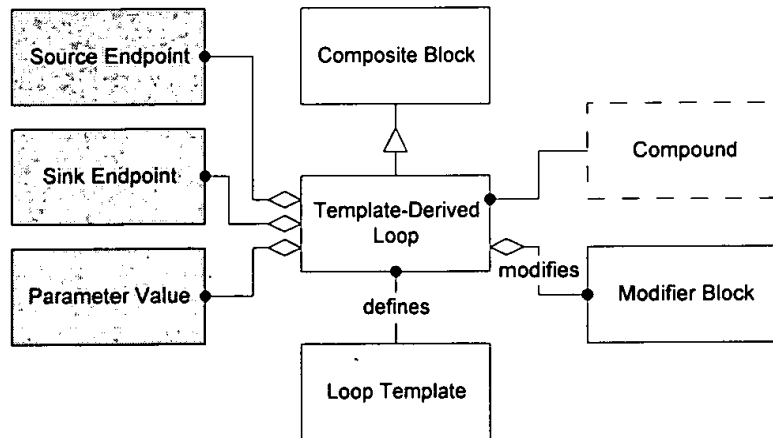


Figure 91 - Template-Derived Loop object model

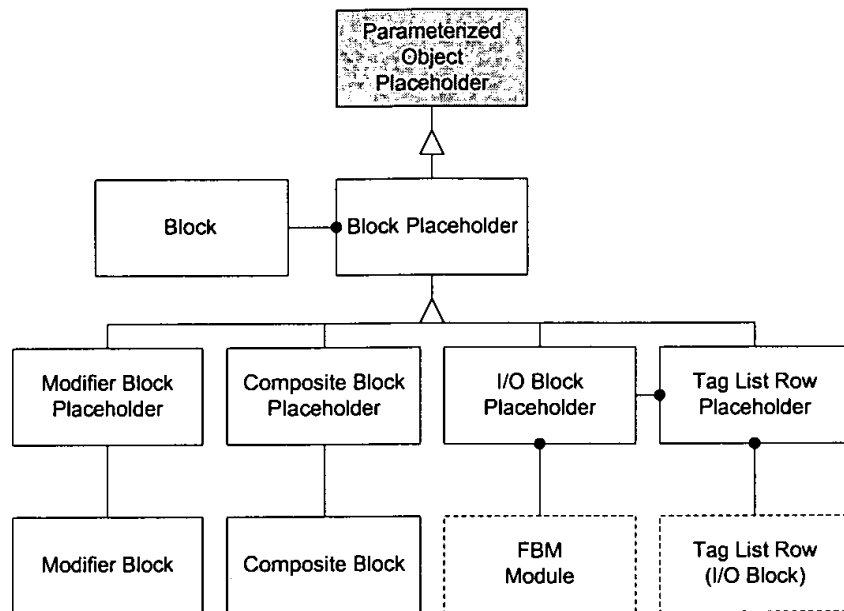


Figure 92 - Object Placeholder derivations

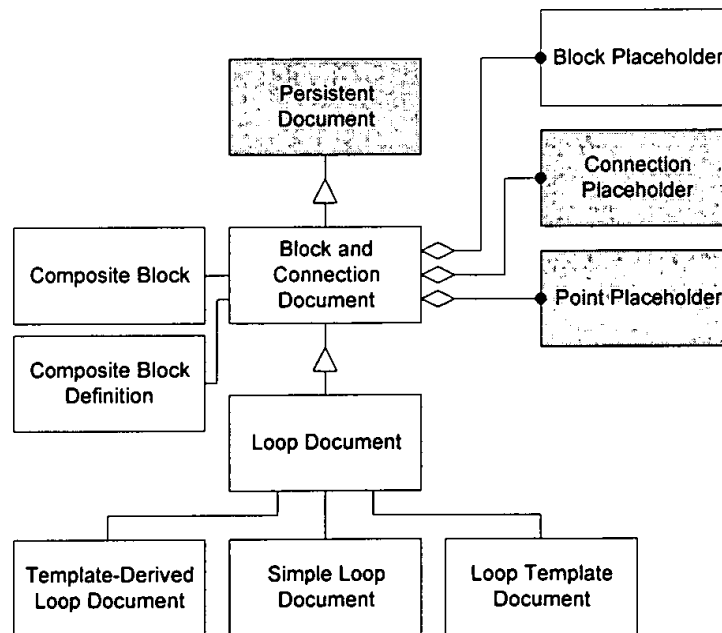


Figure 93 - Persistent Document Object derivations

Abstract

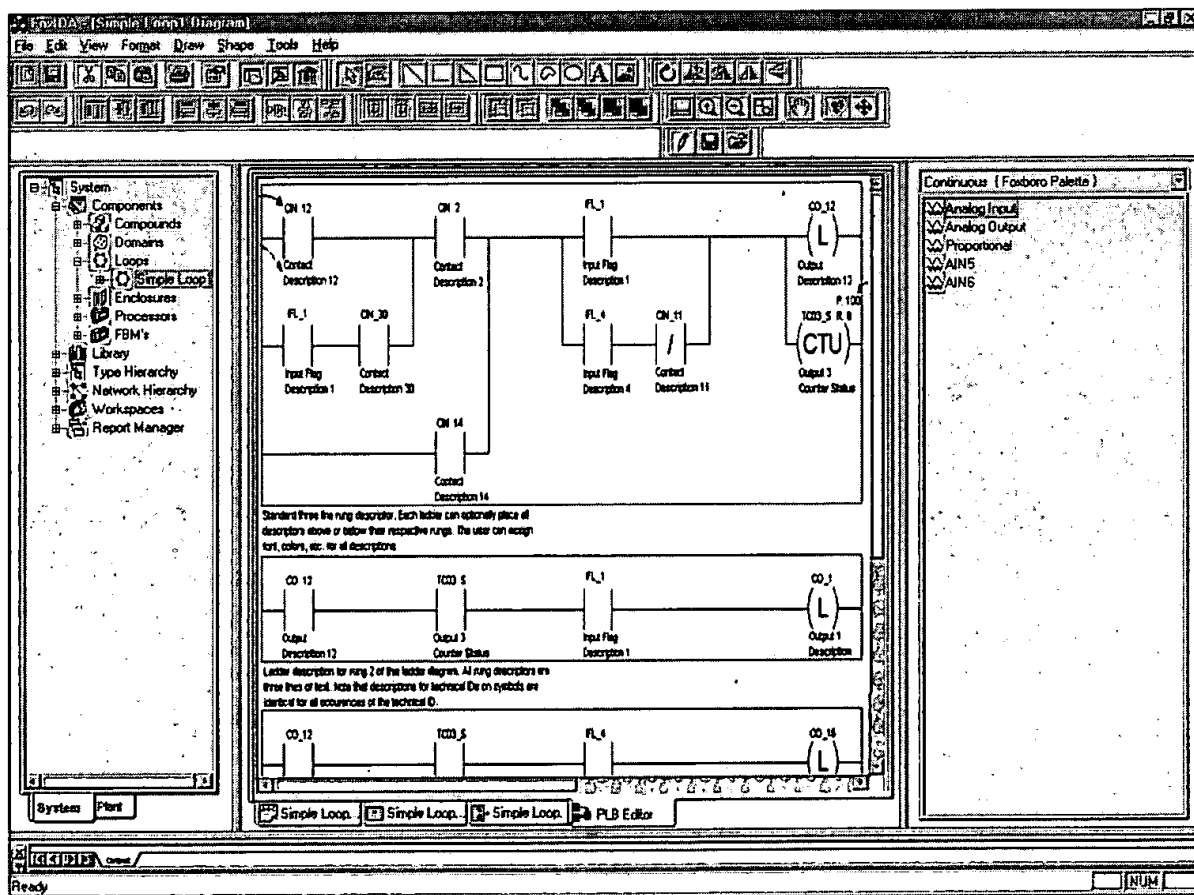


Figure 95 - Ladder Editor View

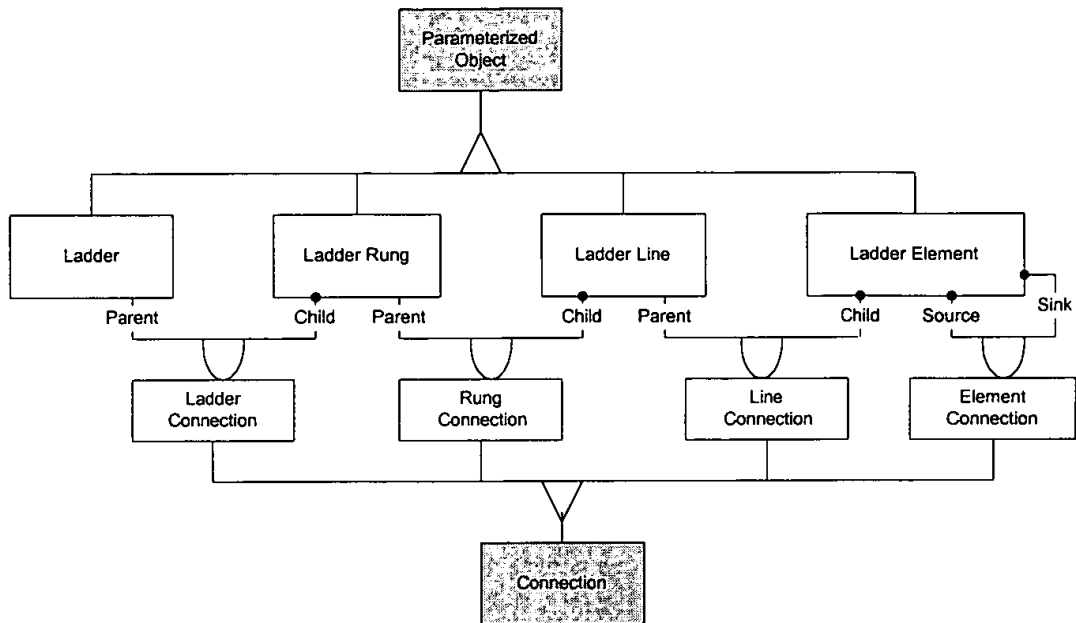


Figure 96 - Ladder Objects

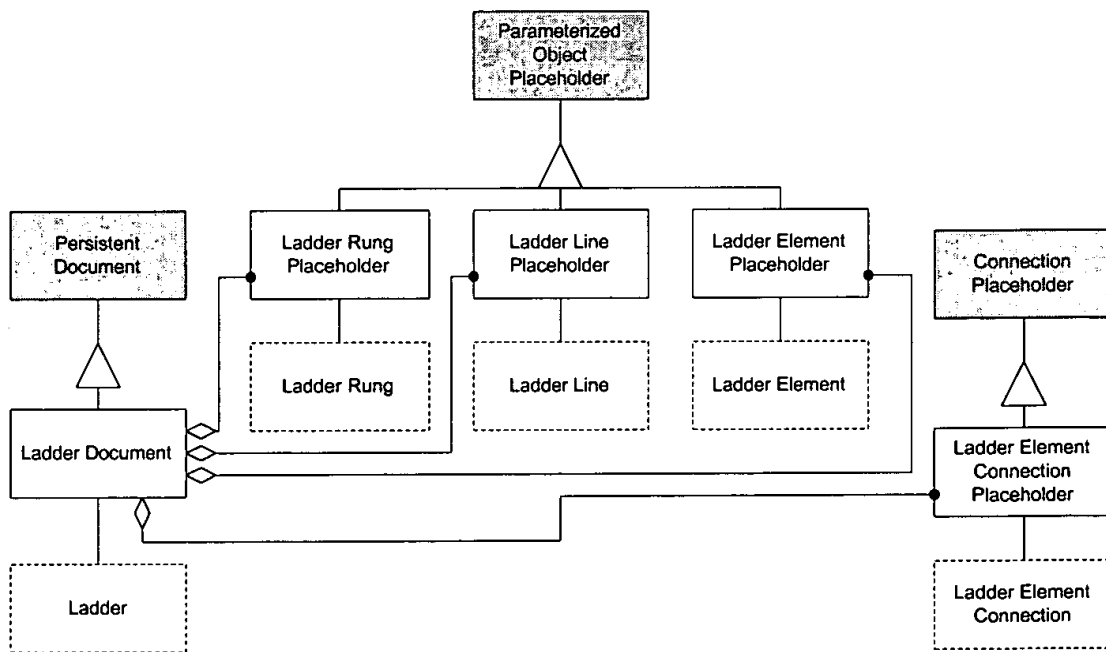


Figure 97 - Persistent Document Objects.

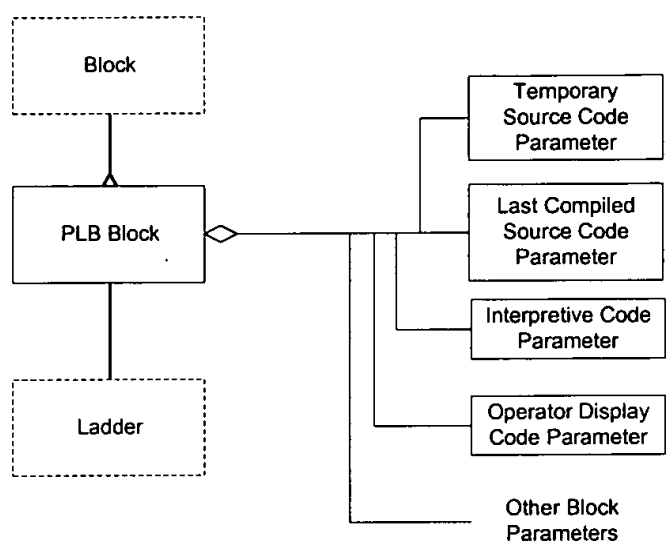


Figure 98 - PLB Block Model

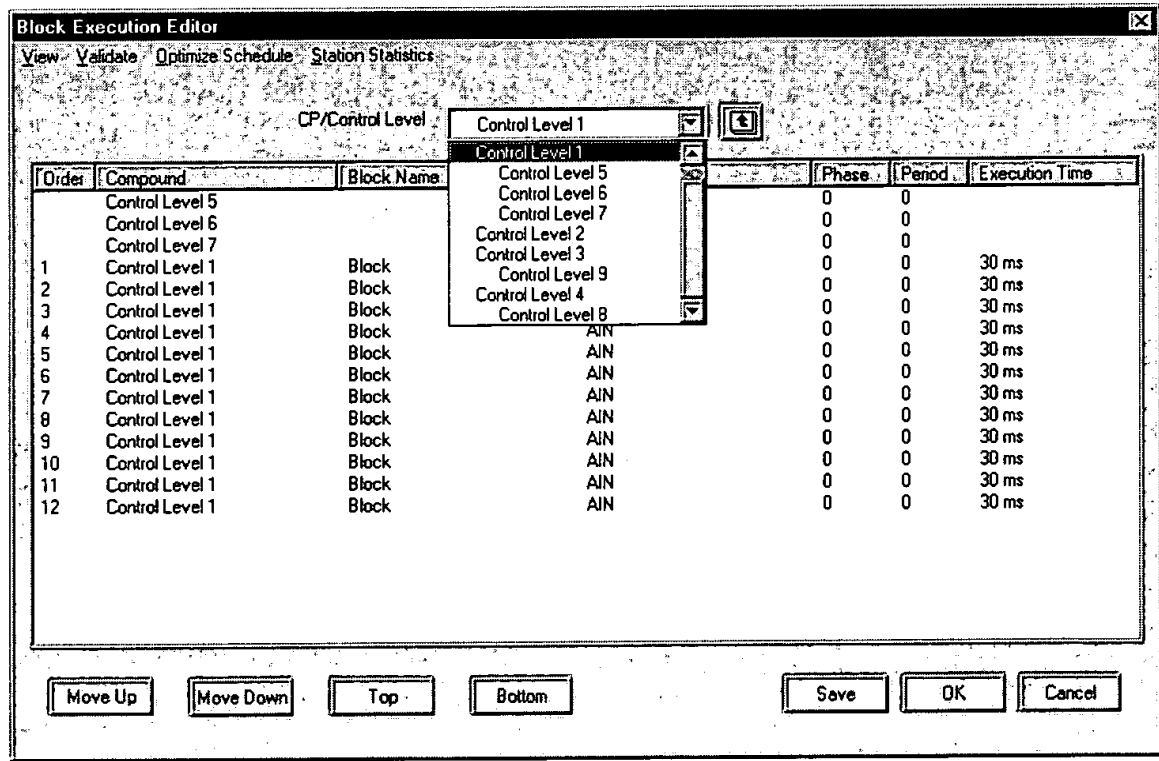


Figure 99 - Block Execution Scheduler Editor

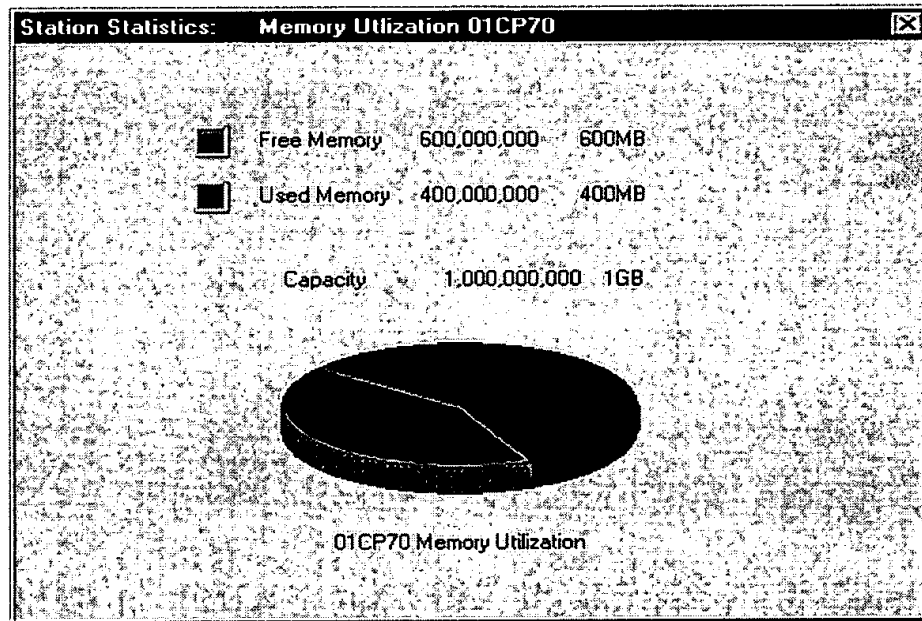


Figure 100 Station Statistics Dialog

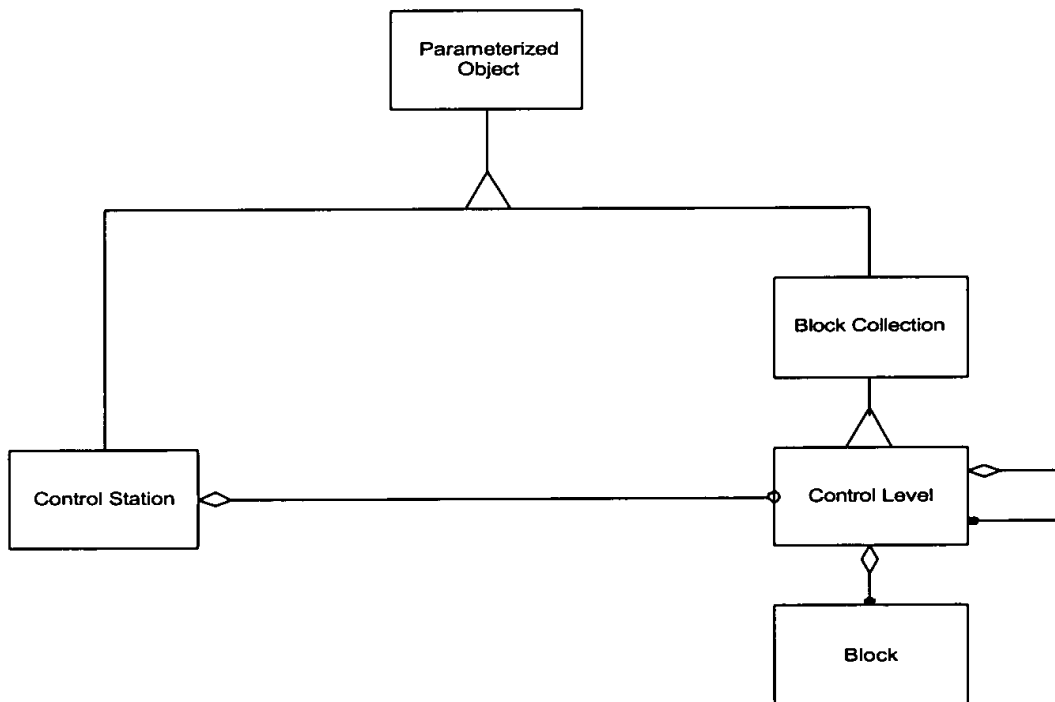


Figure 101 - Block Execution Editor Object Model

DocId: 34437760

TAG List									
Compnd	Tag	L_tag	Descr1	Descr2	Type	Comp	Param	lom_id	lomide
01CP30_PLB	GV0144	GV0144	CONTACT INPUT		PLB	A1	CIN_8	01FM21	
01CP30_PLB	X0120A	X0120	INPUT 1 TO LADDER	LOGIC	PLB	A1	CIN_4	01FM21	
01CP30_PLB	X0120B	X0120	INPUT 2 TO LADDER	LOGIC	PLB	A2	CIN_5	01FM21	
01CP30_PLB	X0120C	X0120	INPUT 3 TO LADDER	LOGIC	PLB	A3	CIN_6	01FM21	
01CP30_PLB	X0120D	X0120	INPUT 4 TO LADDER	LOGIC	PLB	A4	CIN_7	01FM21	
01CP30_PLB	X0120E	X0120	OUTPUT 1 F. LADDER	LOGIC	PLB	A5	CO_9	01FM21	01FM22
01CP30_PLB	X0120F	X0120	OUTPUT 2 F. LADDER	LOGIC	PLB	A6	CO_10	01FM21	01FM22
01CP30_PLB	X0120G	X0120	OUTPUT 3 F. LADDER	LOGIC	PLB	A7	CO_11	01FM21	01FM22
01CP30_PLB	X0120H	X0120	OUTPUT 3 F. LADDER	LOGIC	PLB	A8	CO_12	01FM21	01FM22
02CP30_PLB	HV0210CLOSE	HV0210	VALVE DEVICE LIMIT	CLOSE	PLB	A2	CIN_2	02FM15	
02CP30_PLB	HV0210OC	HV0210	VALVE OPEN CLOSE	SWITCH	PLB	A3	CO_9	02FM15	02FM16
02CP30_PLB	HV0210OPEN	HV0210	VALVE DEVICE LIMIT	OPEN	PLB	A1	CIN_1	02FM15	
2022NAPHTHA	F0215	F0215			AIN	A	PNT	11FM11	
2022NAPHTHA	F0215V	F0215			AOUT	A	OUT	11FM11	
2022NAPHTHA	F0216	F0215			AIN	B	PNT	11FM11	
2022NAPHTHA	F0216V	F0215			AOUT	B	OUT	11FM11	
2022NAPHTHA	F0217	F0215			AIN	C	PNT	11FM11	
2022NAPHTHA	F0217V	F0215			AOUT	C	OUT	11FM11	
2022NAPHTHA	F0218	F0215			AIN	D	PNT	11FM11	
2022NAPHTHA	F0218V	F0215			AOUT	D	OUT	11FM11	
COMPND_0100	F0120	F0120	FLOAT MEASUREMENT	INPUT 1	AIN	A	PNT	01FM14	
COMPND_0100	F0130	F0120	FLOAT MEASUREMENT	INPUT 2	AIN	B	PNT	01FM14	
COMPND_0100	FT0100	F0100	FLOAT	INDICATION	AIN	A	PNT	01FM11	
COMPND_0100	FT0101	F0101	FLOAT	INDICATION	AIN	A	PNT	01FM11	

Figure 102 - Tag List Data Entry Screen

TAG Import - Field Mapping

Field	Contents	#	Table.Field	Type	Width	Dec
Field1	"01CP30_PLB"	1	TAGLIST.COMPND	C	12	0
Field2	"GV0144"	2	TAGLIST.TAG	C	18	0
Field3	"GV0144"	3	TAGLIST.L_TAG	C	24	0
Field4	"CONTACT INPUT"	4	TAGLIST.DESCRP1	C	18	0
Field5	""	5	TAGLIST.DESCRP2	C	14	0
Field6	"PLB"	6	TAGLIST.TYPE	C	8	0
Field7	"A1"	7	TAGLIST.COMP	C	4	0
Field8	"CIN_8"	8	TAGLIST.PARAM	C	10	0
Field9	"01FM21"	9	TAGLIST.IOM_ID	C	6	0
Field10	""	10	TAGLIST.IOMIDE	C	6	0
Field11	""	11	TAGLIST.IOMIDR	C	6	0

Source # Target

Show Start Save Cancel

Figure 103 - Tag List Import from ASCII File

TAG Export - Field Mapping

Field	Contents	#	Table.Field	Type	Width	Dec
Field1		1	TAGLIST.COMPND	C	12	0
Field2		2	TAGLIST.TAG	C	18	0
Field3		3	TAGLIST.L_TAG	C	24	0
Field4		4	TAGLIST.DESCRP1	C	18	0
Field5		5	TAGLIST.DESCRP2	C	14	0
Field6		6	TAGLIST.TYPE	C	8	0
Field7		7	TAGLIST.COMP	C	4	0
Field8		8	TAGLIST.PARAM	C	10	0
Field9		9	TAGLIST.IOM_ID	C	6	0
Field10		10	TAGLIST.IOMIDE	C	6	0
Field11		11	TAGLIST.IOMIDR	C	6	0

Target	#	Source
Field1	<	1 TAGLIST.COMPND
Field2	<	2 TAGLIST.TAG
Field3	<	3 TAGLIST.L_TAG
Field4	<	4 TAGLIST.DESCRP1
Field5	<	5 TAGLIST.DESCRP2
Field6	<	6 TAGLIST.TYPE
Field7	<	7 TAGLIST.COMP
Field8	<	8 TAGLIST.PARAM
Field9	<	9 TAGLIST.IOM_ID
Field10	<	10 TAGLIST.IOMIDE
Field11	<	11 TAGLIST.IOMIDR

Figure 104 - Tag List Export to ASCII File

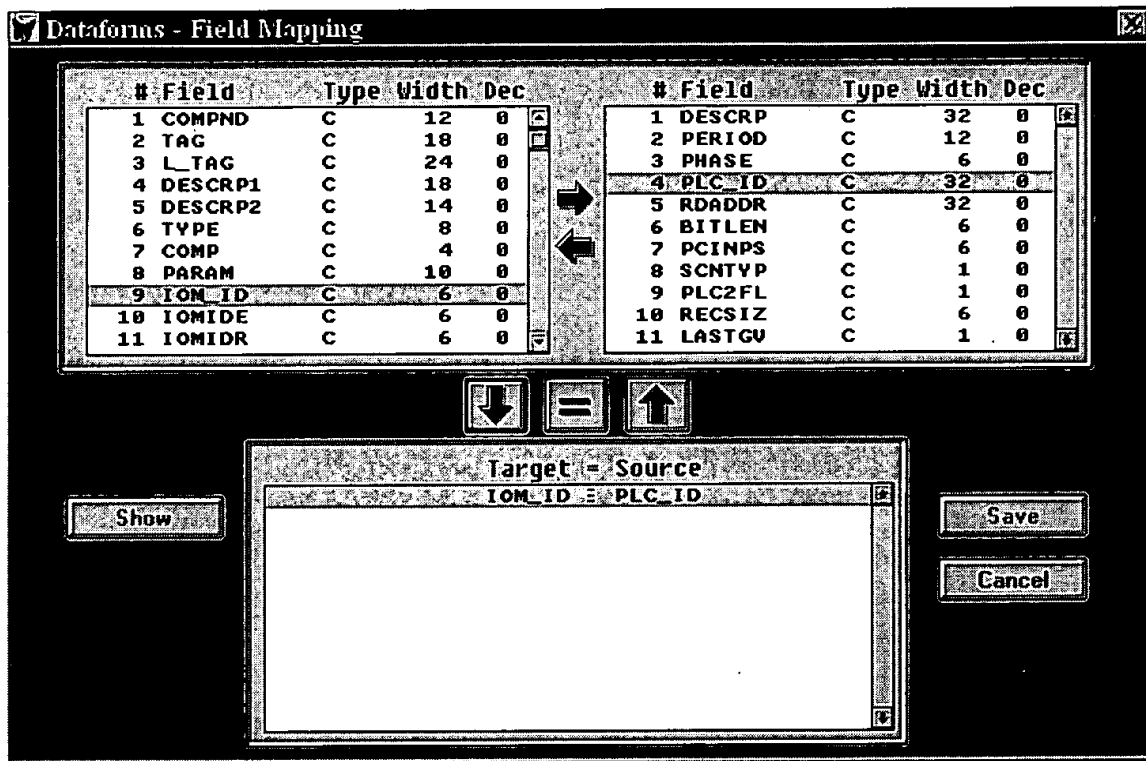


Figure 105 - Tag List Import / Export from Database Table

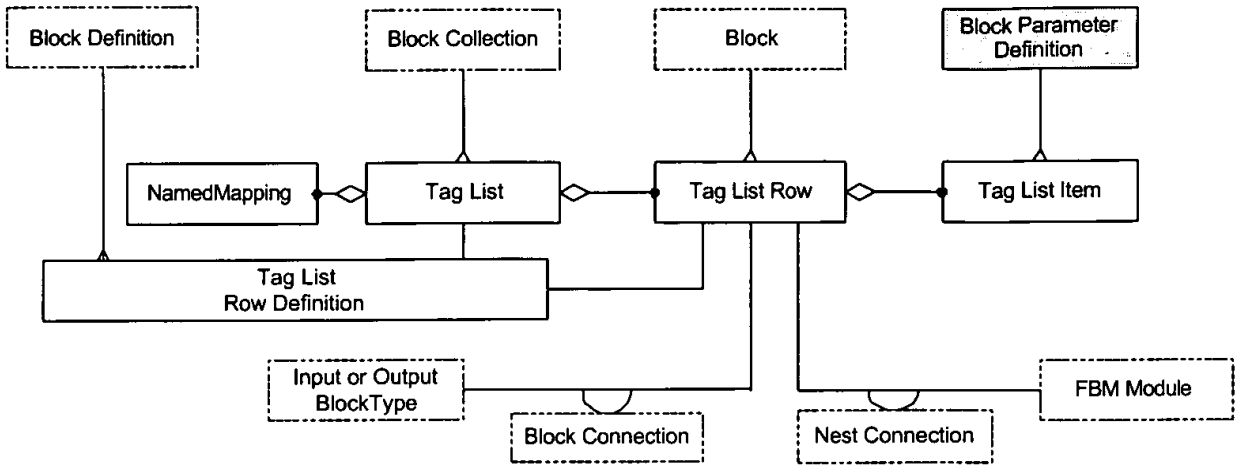


Figure 106 - Tag List Object Model

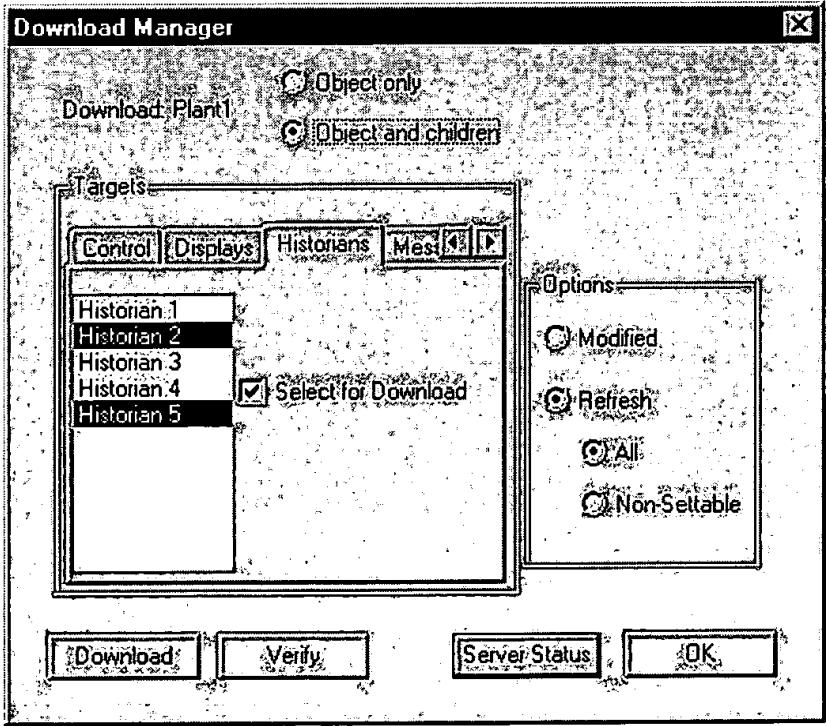


Figure 107 - Download Target Selection

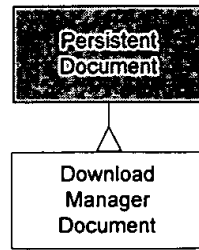


Figure 108 - Download Manager Document Object

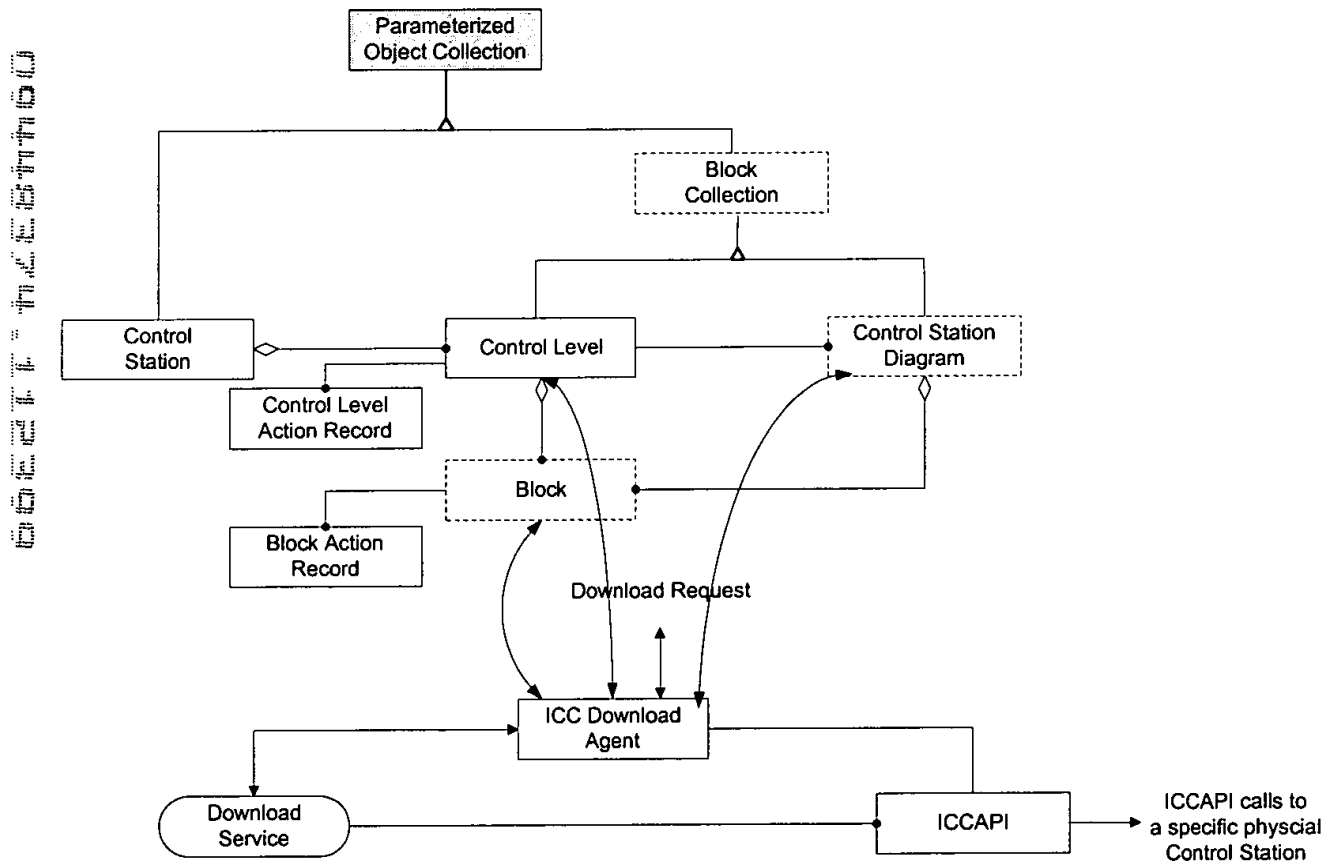


Figure 109 - Download Services Object Model

Historians

Historian	Compound	Param	Per	Delta	Time	Desc
01CP30_PLB	COMPRND_0200					

Historian Change Assignments

Blocks

02FM14_MAIN	MAIN					
02FM15_MAIN	MAIN					
EI0201	CIN					
EI0202	CIN					
F0227	REALUM					
FC0250	PID	FLOW				
FC0259	PID	FLOW				
FC0280	PID	FLOW				
FC0290	PID	FLOW				
FI0220	AIN	FLOW				
FQ0210	ACCUM					
FQ0290	ACCUM					

☐ Show All

Figure 110 - Historian Assignment Overview

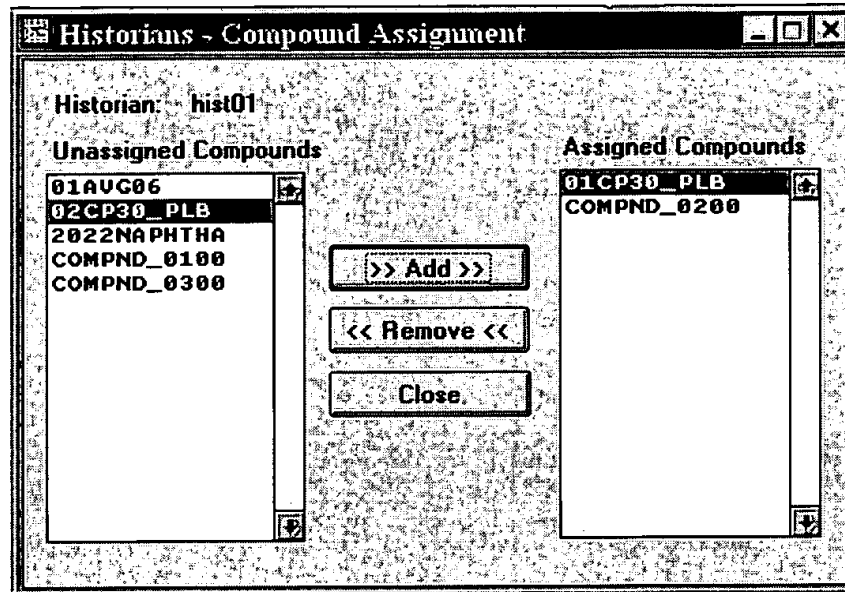


Figure 111 - Individual Compound Assignment

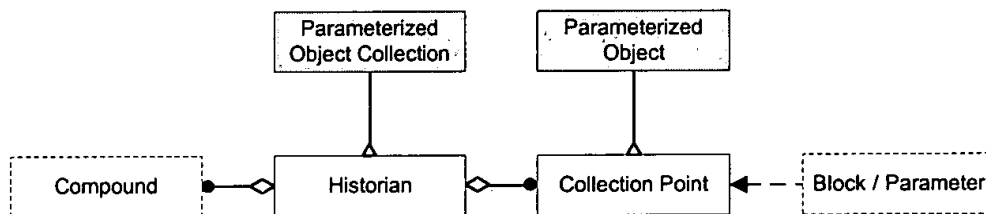


Figure 112 - Historian Object Model

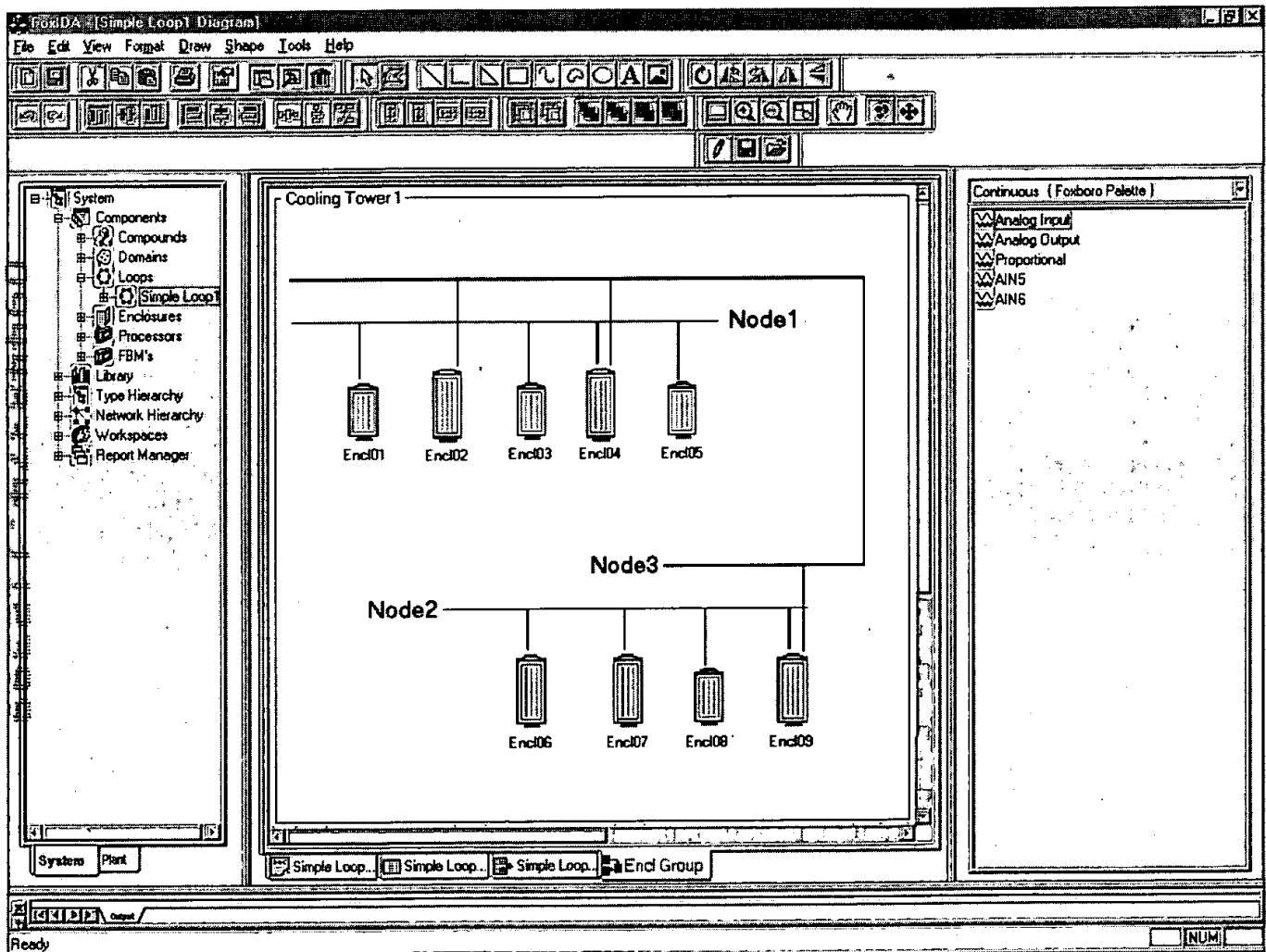


Figure 113 - Enclosure Group View

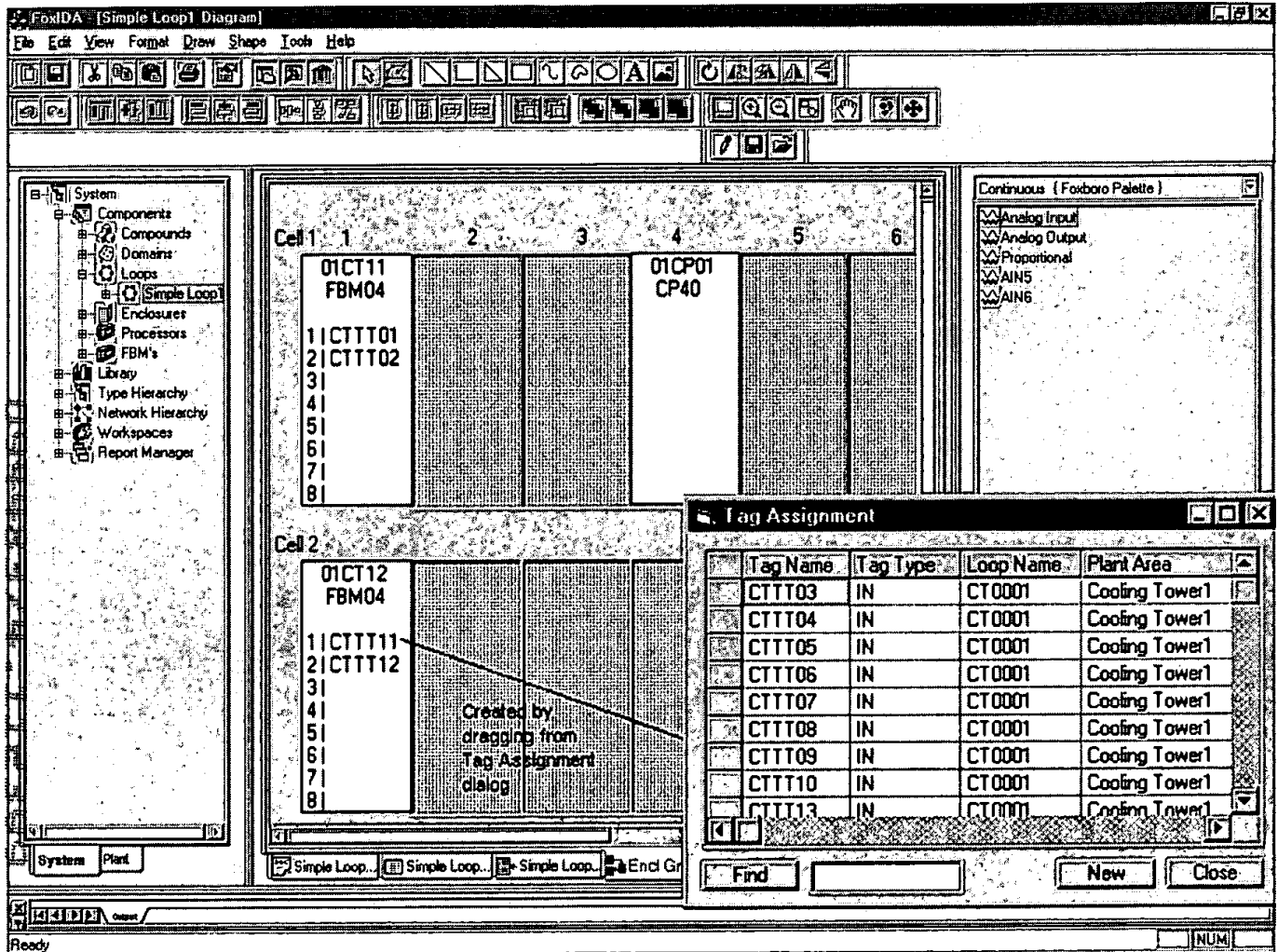


Figure 114 - Enclosure Loading View and Tag Assignment Dialog

EK044518085US

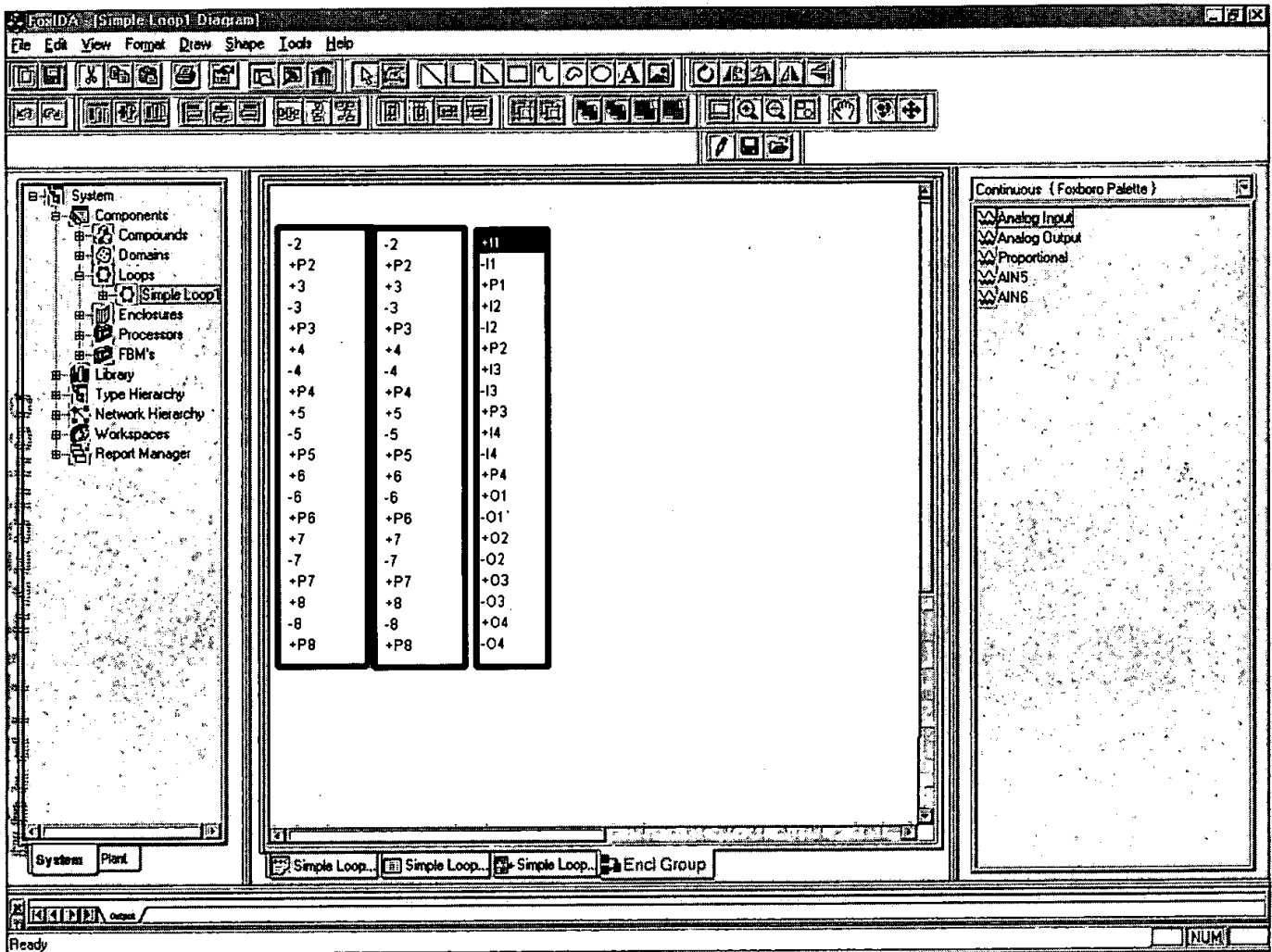


Figure 115 - Enclosure Input/Output Termination View

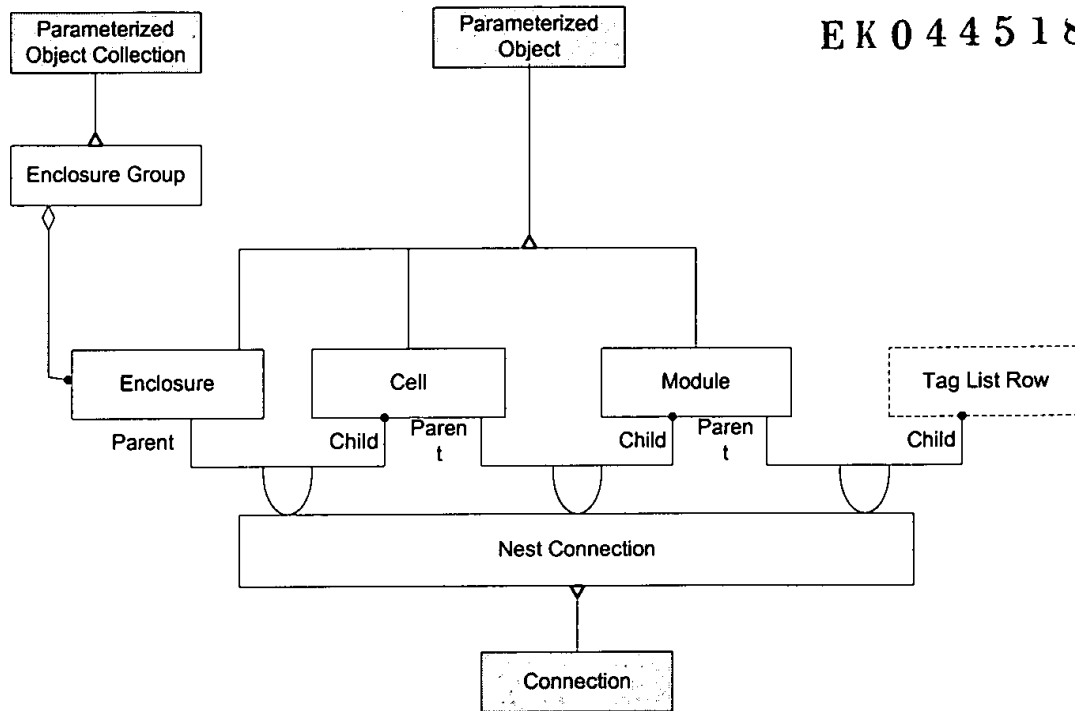


Figure 116 - Enclosure Loading Model

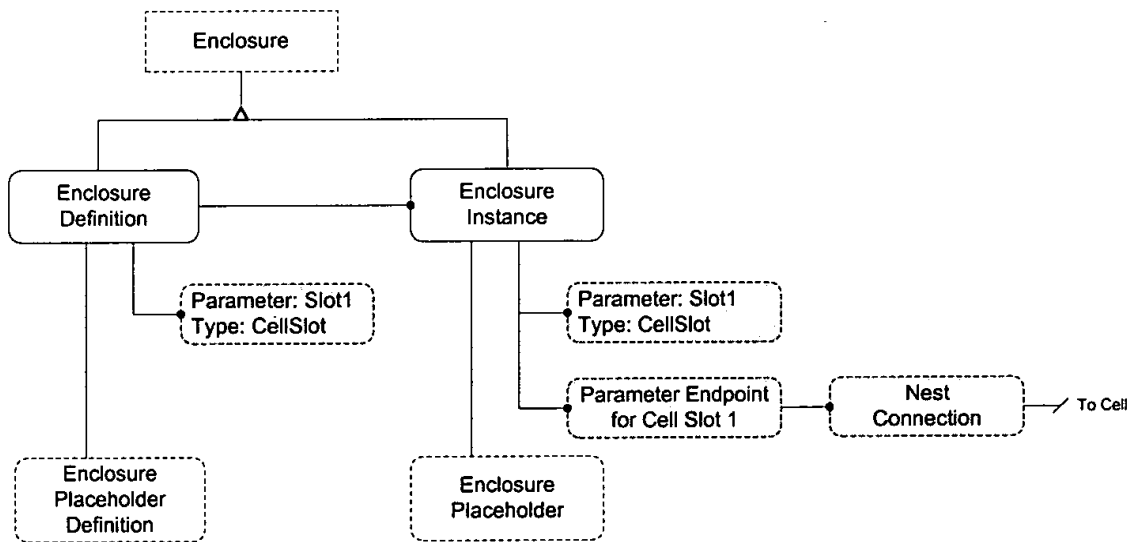


Figure 117 - Enclosure Definition Detail Model

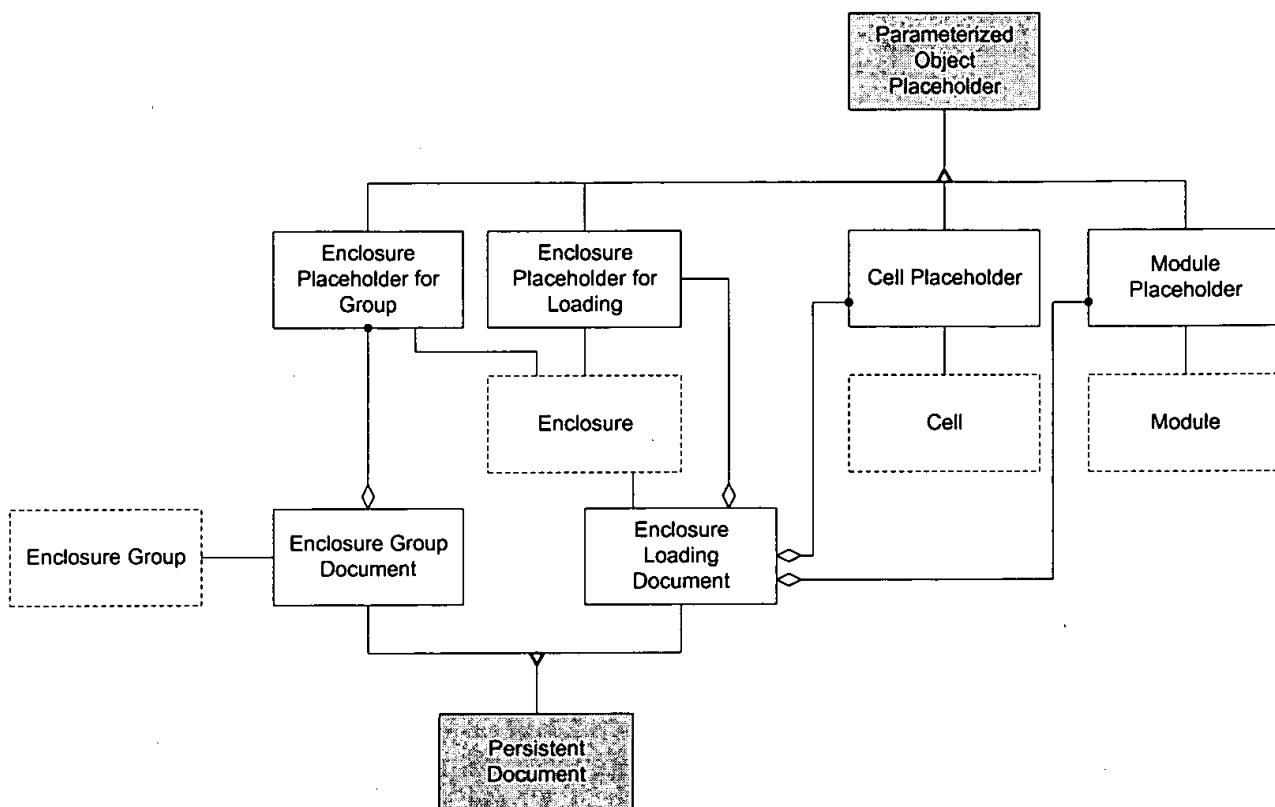


Figure 118 - Persistent Document Objects.

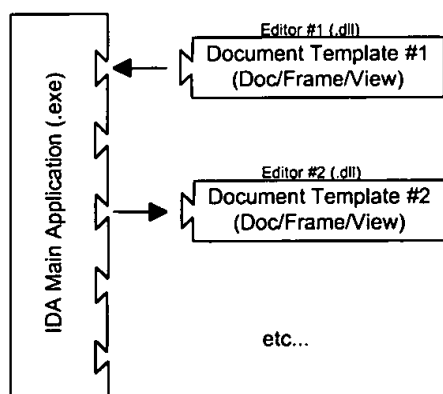


Figure 119 - IDA Main Application Architecture

SECRET - 742577150

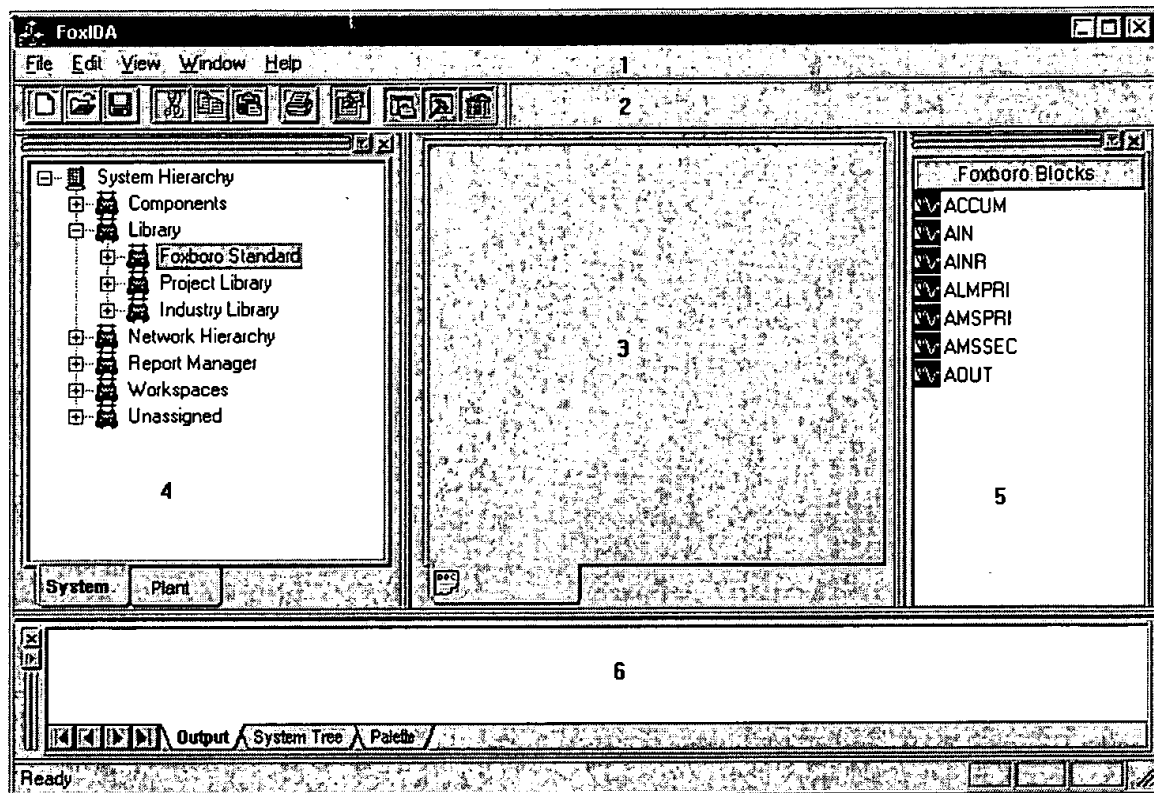


Figure 120 - Typical IDA Generic Editor Frame

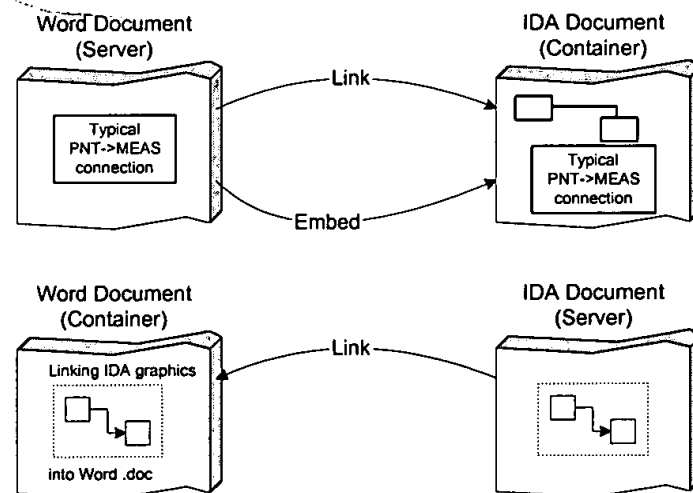


Figure 121 - IDA & OLE Compound Documents